

**COMPLIANCE MONITORING SYSTEM
SAMPLING ACTIVITIES**

**END OF YEAR 2003 MONITORING EVENT
AT THE**

BUILDING 20 / 25 AREA

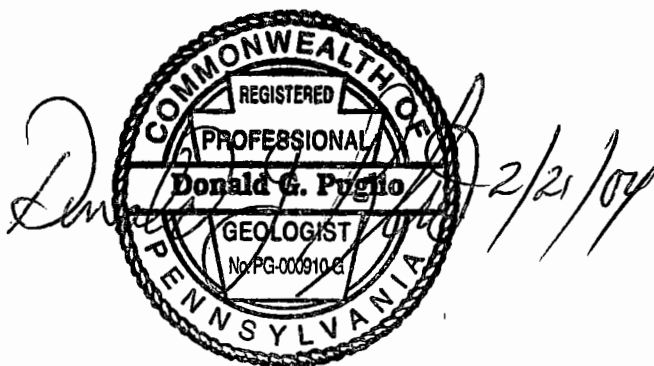
**PENNSYLVANIA TRANSFORMER TECHNOLOGY, INC.
CANONSBURG, PENNSYLVANIA**

**COMPLIANCE MONITORING SYSTEM
SAMPLING ACTIVITIES**

**END OF YEAR 2003 MONITORING EVENT
AT THE**

BUILDING 20 / 25 AREA

PENNSYLVANIA TRANSFORMER TECHNOLOGY, INC.
CANONSBURG, PENNSYLVANIA



Prepared By:
Environmental Products & Services, Inc.
Harrisburg Branch Office
5140 Paxton Street
Harrisburg, PA 17111

FEBRUARY, 2004



**COMPLIANCE MONITORING SYSTEM
SAMPLING ACTIVITIES**

**END OF YEAR 2003 MONITORING EVENT
AT THE**

BUILDING 20 / 25 AREA

PENNSYLVANIA TRANSFORMER TECHNOLOGY, INC.
CANONSBURG, PENNSYLVANIA

TABLE OF CONTENTS

	<u>page</u>
INTRODUCTION	1
MONITORING NETWORK	2
WELLS	2
CHARTIERS CREEK AND TREATMENT SYSTEM	3
FIELD ACTIVITIES: END-OF-YEAR 2003 MONITORING EVENT	4
GROUNDWATER AND SURFACE WATER MONITORING DATA	5
GROUNDWATER ELEVATION DATA AND LIQUID HYDROCARBON EXTENT	5
GROUNDWATER CHEMISTRY DATA	6
QUALITY ASSURANCE / QUALITY CONTROL SAMPLES	7
OVERBURDEN ZONE	8
SHALLOW BEDROCK ZONE	10
DEEP BEDROCK ZONE	12
STREAM CHEMISTRY - CHARTIERS CREEK	14
TREATMENT SYSTEM INFLUENT AND CARBON FILTRATION SYSTEM	15
OVERVIEW OF TREATMENT SYSTEM OPERATIONS	17
CONCLUSIONS AND RECOMMENDATIONS	18
CONCLUSIONS	18
RECOMMENDATIONS	19

LIST OF TABLES

TABLE 1	Summary - Groundwater Monitoring / Sampling Schedule
TABLE 2	Selected Well Information - Including: Groundwater Depth, Elevation, Thickness Of Water Column In Well, and Liquid Hydrocarbon Occurrence (<i>LNAPL</i>) (Three Pages)
TABLE 3	Groundwater Chemistry Data - Quality Assurance / Quality Control Samples

TABLE OF CONTENTS

(continued)

- TABLE 4** Groundwater Chemistry Data - Overburden Wells (Two Pages)
- TABLE 5** Groundwater Chemistry Data - Shallow Bedrock Wells (Three Pages)
- TABLE 6** Groundwater Chemistry Data - Deep Bedrock Wells
- TABLE 7** Groundwater Chemistry Data - Chartiers Creek - Stream Samples
- TABLE 8** Groundwater Chemistry Data - Treatment System Influent and Carbon Filtration System

LIST OF FIGURES

- FIGURE 1** Site Location Map (DWG: *MP00300*)
- FIGURE 2** Site Plan (DWG: *MP00301*)
- FIGURE 3** Groundwater Contour Map, Overburden Wells (DWG: *MP00303*)
- FIGURE 4** Groundwater Contour Map, Shallow Bedrock Wells (DWG: *MP00304*)
- FIGURE 5** Hydrocarbon Isopach Map, Overburden Wells (DWG: *MP00305*)
- FIGURE 6** Groundwater Chemistry Map (DWG: *MP00306*)

LIST OF APPENDIXES

- Appendix A** Observation Well Field Data - Monitoring Wells - Building 20 / 25 Network
End-Of-Year Monitoring / Sampling Event, December, 2003
- Appendix B** Results of Chemical Analyses - Monitoring Well Samples,
Including Equipment, Field, and Trip Blanks - Building 20 / 25 Network
End-Of-Year Monitoring / Sampling Event, December, 2003
- Appendix C** Results of Chemical Analyses - Chartiers Creek Stream Samples
End-Of-Year Monitoring / Sampling Event, December, 2003
- Appendix D** Results of Chemical Analyses - Treatment System Influent and Carbon Filtration System
End-Of-Year Monitoring / Sampling Event, December, 2003

INTRODUCTION

Environmental Products and Services, Inc. (*EP&S*) was retained by Pennsylvania Transformer Technology, Inc. (*PTTI*) to provide the **End-Of-Year, 2003 (E-O-Y, 2003)** comprehensive groundwater compliance monitoring for the **Building 20 / 25 Area (B20 / 25A)** at *PTTI's* Canonsburg, Pennsylvania facility (*FIGURE 1*). This facility was formerly known as the Cooper Power Systems Facility, operated by Cooper Industries (*CI*). This report presents the results of the **E-O-Y, 2003** groundwater monitoring event. Field activities at the **B20 / 25A** network were conducted between Tuesday, December 13 and Friday, December 22, 2003.

This compliance monitoring is an element of the "Compliance Monitoring System Plan" (*CMS*) that was developed and implemented to assess the efficiency of the **B20 / 25A** network groundwater recovery system. The *CMS* Plan was developed in 1993 and modified by *Exhibit K-1* of the June 29, 2001 Consent Order and Agreement (*COA*) that was struck between the Pennsylvania Department of Environmental Protection (*PA DEP*), *CI*, and *PTTI*. *CI* is the previous owner of the facility. The *PA DEP* is provided with all pertinent information and data collected during monitoring events at the **B20 / 25A** network.

Quarterly compliance groundwater monitoring at the **B20 / 25A** network was initiated during the second quarter of 1992. Per an agreement between the *PA DEP* and *CI*, semiannual compliance groundwater monitoring and reporting has been in effect since the first semiannual event that was conducted in 1997. Earth Sciences Consultants, Inc. (*ESCI*) provided consulting services including compliance monitoring, at the **B20 / 25A** network for *CI* between April, 1992 and January, 2001. *PTTI* "assumed" total responsibility for monitoring and sampling at the **B20 / 25A** network, beginning with the **End Of Year, 2001 (December, 2001)** monitoring event. *EP&S* has been involved with five monitoring events: **E-O-Y, 2003, M-Y, 2003, E-O-Y, 2002, M-Y, 2002, and E-O-Y, 2001.**

MONITORING NETWORK

WELLS

The routine compliance groundwater monitoring activities provide the information needed to determine the effectiveness of the recovery system and to observe changes in the vertical and horizontal extent of contamination at the **B20 / 25A** network. This report presents the results of the **E-O-Y, 2003** groundwater monitoring event, conducted in December, 2003 by *EP&S*.

The groundwater compliance monitoring well network originally included a total of 30 monitoring wells (*TABLE 1*). However, three wells have been "lost / damaged" (**MW-S3**, **PZ-S7**, and **MW-D3**). Additionally, one well (**MW-D5**) had been previously dropped from the monitoring program. And, one well (**MW-S5 / RS-5**) is a recovery well that contains a recovery pump. A liquid level can be measured in this well, but a sample is not "historically" collected from it. This well (**MW-S5 / RS-5**) was accessed for gauging during the **E-O-Y, 2003** groundwater monitoring event; this well is actually located within Building 20 / 25. Consequently, the groundwater compliance monitoring well network now includes a total of 26 monitoring wells-25 of which can be used to collect samples for chemical analyses. Groundwater samples are not normally collected from wells that have "historically" contained "standing / measurable product" above the water table (or, the water level in the well).

The following wells (**ten total**) are classified as *overburden wells* and communicate with groundwater within the overburden or unconsolidated materials throughout the **B20 / 25A** network: **MW-S1**, **MW-S4**, **MW-S6**, **MW-S8**, **MW-S9A**, **MW-S10**, **MW-S15**, **MW-S16**, **PZ-S18**, and **PZ-S19**. The following wells (**11 total**) are classified as *shallow bedrock wells* and communicate with the shallow bedrock water-bearing zone: **MW-D1**, **PZ-D2**, **MW-D4**, **MW-D6**, **PZ-D7**, **MW-D8**, **MW-D9A**, **MW-D15**, **MW-D16**, **PZ-D18**, and **PZ-D19**. Four of the wells (**MW-9**, **MW-11**, **MW-12**, and **PZ-D14**) are classified as *deep bedrock wells*; these wells communicate with the deep bedrock water-bearing zone. Groundwater flow in the *deep bedrock* regime has not been mapped "historically". However, groundwater flow in this horizon is similar to the groundwater flow direction in the *overburden* and *shallow bedrock* zones /

horizons, which is generally **east-southeast**, or, "towards" Chartiers Creek.

During the **E-O-Y, 2003** groundwater monitoring event, routine compliance groundwater monitoring activities included semiannual liquid level measurements at 26 monitoring locations. Groundwater samples for laboratory analysis were collected from 26 of the 26 compliance monitoring wells.

Monitoring wells that have "historically showed" the consistent presence of a liquid hydrocarbon layer were gauged-but were not sampled for chemical analyses, during the **E-O-Y, 2003** groundwater monitoring event. Consequently, wells **MW-S15** and **MW-S16** were **not** sampled for chemical analysis as part of this event; neither was a sample collected from well **MW-S5 / RS-5**, which is a recovery well that also "historically shows" the consistent presence of a liquid hydrocarbon layer. A summary of the groundwater monitoring schedule is also included in **TABLE 1**.

CHARTIERS CREEK AND TREATMENT SYSTEM

Three surface water samples-"taken from" Chartiers Creek, were also collected as part of the **E-O-Y, 2003** event. One sample is located downstream (**Downstream Sample**) of *Outfall 003*. Two of the stream samples (**Upstream Sample # 1** and **Upstream Sample # 2**) are located upstream of *Outfall 003*. The exact location of *Outfall 003* relative to the three sample locations is depicted in **FIGURE 2**.

The collection of one groundwater treatment system influent sample (**Before Treatment System**) and three samples (**Between PC1 and PC2**, **Midpoint Of Treatment System**, and **Between PC3 and PC4**) from the groundwater treatment system's series of carbon filtration units is also included as part of the monitoring requirements for the **B20 / 25A** network. The groundwater treatment system is located in Building 90 at the *PTTI* site. Water samples were successfully collected from each of these four points in the treatment system. Monitoring well and stream sampling locations at the **B20 / 25A** network are depicted in **FIGURE 2**.

FIELD ACTIVITIES: END-OF-YEAR, 2003 MONITORING EVENT

The E-O-Y, 2003 compliance groundwater monitoring event at the B20 / 25A network was conducted between Tuesday, December 13 and Friday, December 19, 2003. The event generally consisted of the following tasks:

- 1- Measurement of groundwater levels-elevation, lighter than water nonaqueous phase liquids (LNAPL) thickness, and possible dense nonaqueous phase liquids (DNAPL) presence, at 26 monitoring well locations.
- 2- Collection of groundwater samples from 23 of the 26 monitoring well locations.
- 3- Collection of three surface water samples from Chartiers Creek.
- 4- Collection of one groundwater sample from the treatment system influent and three groundwater samples from the treatment system's carbon filtration units-between the primary and secondary granular-activated carbon (GAC) units and after the secondary GAC unit.
- 5- Collection of a field blank, an equipment blank, a trip blank, and 1 duplicate sample from monitoring well MW-11 (samples MW-11a and MW-11 b) for quality assurance and quality control purposes (QA / QC).
- 6- Visual determination of which samples potentially "contain" the presence of polychlorinated biphenyl (PCB) or volatile organic compound (VOC) contamination. All samples are "routinely" analyzed for the presence of both PCBs and VOCs.
- 7- Submission of surface and ground water samples for analysis along with completed chains-of-custody.

Groundwater sampling methodologies were completed in accordance with those adhered to historically and which are described in *Exhibit K-1, Groundwater Sampling and Monitoring Protocol*. Additional field parameters consisting of: pH, oxidation-reduction potential, temperature, turbidity, specific conductance, and salinity were also measured / collected from samples at selected monitoring wells to evaluate the occurrence of natural attenuation processes in the groundwater regime. Observation well field data for each of the 30 wells in the B20 / 25A monitoring network-including those four wells that have been "lost / damaged" and / or removed from the sampling plan (MW-S3, PZ-S7, MW-D3, and MW-D5), are included in **APPENDIX A** of this report.

As part of this monitoring event, a **FIELD BLANK**, an **EQUIPMENT BLANK**, and a **TRIP BLANK** were prepared / collected for *QA / QC* purposes. Additionally, two samples were also collected from monitoring well **MW-11** (samples **MW-11a** and **MW-11b**) for *QA / QC* purposes. A duplicate sample was collected from **MW-11** to evaluate the “consistency” of the laboratory analytical results. The **TRIP BLANK** sample accompanied the samples during groundwater sampling activities to verify that neither the samples nor sample containers were contaminated in transit to and / or from the laboratory. The **EQUIPMENT BLANK** was submitted to evaluate proper decontamination of the sampling equipment. And, the **FIELD BLANK** sample was submitted evaluate ambient conditions at the site.

GROUNDWATER AND SURFACE WATER MONITORING DATA

GROUNDWATER ELEVATION DATA AND LIQUID HYDROCARBON EXTENT

Groundwater elevation data for the overburden, shallow bedrock, and deep bedrock horizons, respectively, are summarized in **TABLE 2**. The groundwater elevation data collected during this event was used to up-date groundwater contour maps and re-evaluate groundwater flow direction in the overburden and shallow bedrock water-bearing zones. Groundwater flow direction in the overburden horizon is presented in **FIGURE 3**. Shallow bedrock groundwater flow direction is presented in **FIGURE 4**. Overburden and shallow bedrock groundwater flow directions did not vary significantly from previous monitoring events. The general, implied flow of groundwater in the **overburden zone** is **east-southeast**, or, generally “towards” Chartiers Creek. The general flow of groundwater in the **shallow bedrock zone** is **east-southeast**, also generally “towards” Chartiers Creek..

A groundwater “sink” (a lowering of the groundwater zone / horizon elevation surface) is the consequence of pumping activity in the recovery well-MW-S5 / RS-5, which is located in Building 25 (also see **FIGURE 3** and **FIGURE 4**). The “sink” is most pronounced in the **overburden zone**, where the groundwater elevation is **drawn-down** more than **ten feet** from the “normal” groundwater elevation. However, the “sink” is somewhat noticeable in the **shallow bedrock zone**, where the groundwater elevation is **drawn-down** about **three feet** from the

“normal” groundwater elevation.

Liquid hydrocarbon occurrence data for both the **E-O-Y, 2003** as well as the **M-Y, 2003** events is also presented in **TABLE 2**. Recorded floating hydrocarbon occurrence data were in general agreement with “historical” data from the site. Recorded *LNAPL* thickness, in each of the three wells (**MW-S15**, **MW-S16** and **MW-S5 / RS-5**) that have historically contained “standing product”, was slightly greater than that measured during the **M-Y, 2003** event.

Overburden monitoring well **MW-S15** exhibited an approximate **0.10-foot** thick *LNAPL* layer on the water table; well **MW-S16** exhibited an approximate **0.37-foot** thick *LNAPL* layer on the water table. Well **MW-S5 / RS-5** exhibited an approximate **0.13-foot** thick *LNAPL* layer on the water table. These three wells exhibited the following *LNAPL* layer thickness during the **M-Y, 2003** event, respectively: *0.08-foot*, *0.24-foot*, and *0.13-foot*. A hydrocarbon isopach map is included in **FIGURE 5**. No evidence of *DNAPL* was detected during the gauging and sampling activities conducted during either of the **E-O-Y, 2003** or the current, **M-Y, 2003**, compliance groundwater monitoring events.

GROUNDWATER CHEMISTRY DATA

The **23 groundwater samples**, four *QA / QC* samples, three surface water samples collected from Chartiers Creek, and the **four treatment system samples** collected during this monitoring event were analyzed by Pace Analytical Services, Inc (*PASI*) under the direction of *PTTI*. For the **E-O-Y, 2003** compliance groundwater monitoring event, **eight** groundwater samples were collected from *overburden wells*, **eleven** groundwater samples were collected from *shallow bedrock wells*, and **four** groundwater samples were collected from *deep bedrock wells*. *PASI* analyzed each of the groundwater samples for the occurrence / nonoccurrence of following parameters: polychlorinated biphenyls (*PCBs*), total petroleum hydrocarbons (*TPH*), total organic carbon (*TOCs*), and volatile organics (*VOCs*). The *TPH* “parameters” evaluated include: *DRO* (**Diesel Range Organics**) and *GRO* (**Gasoline Range Organics**). The **FIELD BLANK**, **EQUIPMENT BLANK**, and **TRIP BLANK** samples were evaluated only for the occurrence of *VOCs*.

Water samples collected from *Chartiers Creek* and the *Treatment System* were evaluated for the occurrence / nonoccurrence of following parameters: polychlorinated biphenyls (*PCBs*), total petroleum hydrocarbons (*TPH*), total organic carbon (*TOCs*), and volatile organics (*VOCs*). The *TPH* "parameters" evaluated include: *DRO* (**Diesel Range Organics**) and *GRO* (**Gasoline Range Organics**).

Laboratory results of chemical analyses for monitoring well samples (groundwater) submitted to *PASI* are included in **APPENDIX B** of this report. **APPENDIX B** contains the results of analyses for all samples collected from the **23 monitoring wells** as well as the results for the FIELD BLANK, EQUIPMENT BLANK, and the TRIP BLANK samples. Laboratory results of analyses-for each monitoring well in the **B20 / 25A** network as well as the samples collected from Chartiers Creek and the Treatment System, are graphically represented in **FIGURE 6**. This figure depicts the type (s) and concentration of pollutant (s) that occurred in the samples collected from the monitoring wells in the three groundwater horizons / regimes: the overburden, shallow bedrock, and deep bedrock networks.

APPENDIX C contains the results of analyses for the three stream samples collected from Chartiers Creek. And, **APPENDIX D** contains the results of analyses for the three samples collected from the treatment system. Generally, the results of analyses for both the surface water (Chartiers Creek) and treatment system samples are similar to "historical results" observed from those locations.

QUALITY ASSURANCE / QUALITY CONTROL SAMPLES

Analytical results for the five *QA / QC* samples are summarized in **TABLE 3**. The *QA / QC* samples analyzed include the FIELD BLANK, EQUIPMENT BLANK, and the TRIP BLANK samples. Two samples were collected from well MW-11 for *QA / QC* purposes. These samples have been designated as **MW-11a** and **MW-11b**.

VOCs were not detected in the FIELD BLANK, EQUIPMENT BLANK, TRIP BLANK

samples. As was indicated previously, the "blanks" were not evaluated for the occurrence of *TPH*, *PCBs*, or *TOC*.

Duplicate samples were collected from well MW-11 (**MW-11a** and **MW-11b**). As with the **M-Y, 2003** groundwater monitoring event, results of analyses indicate that each sample from well MW-11 contains a "similar" concentration of *TOC*. Relatively "low levels" of *TOC* were detected (**2.6-mg/l** and **2.1-mg/l**, respectively) in both MW-11a and MW-11b. **Carbon disulfide** was also detected in each sample-at a concentration of **33-mg/l** and **26-mg/l**, respectively. The concentration of **carbon disulfide** in the two samples collected from well MW-11, however, is well below the established, Pennsylvania, *MSC* concentration (for **carbon disulfide**) for a *NU NR A*, that value being **4,100-μg/l**. No other contaminants (either *PCBs* or *VOCs*) were detected in the duplicate samples collected from well MW-11. This is also consistent with "historical" analytical results for the quality control (duplicate) samples collected from this well.

OVERBURDEN ZONE

Analytical results for the **eight overburden groundwater monitoring wells** are summarized in **TABLE 4** (two pages). Groundwater samples collected from these **eight monitoring wells** are analyzed for the occurrence of *TPH*, *PCBs*, *TOC* and *VOCs*. Samples were collected from the following eight overburden wells: **MW-S1, MW-S4, MW-S6, MW-S8, MW-S9A, MW-S10, PZ-S18, and PZ-S19**.

DRO was detected in samples collected from four of the eight **overburden groundwater monitoring wells**. Concentration of *DRO* in these samples ranges between **1.2-μg/l** (MW-S9A) and **440-μg/l** (MW-S4). *GRO* was detected in samples collected from one of the eight **overburden groundwater monitoring wells**. Concentration of *GRO* in this sample is **2.6-μg/l**; *GRO* was detected in the sample collected from well MW-S4.

PCBs were detected in samples collected from four of the eight **overburden groundwater**.

○ monitoring wells sampled. Concentration of *PCBs* ("exclusively" Aroclor 1260) in these samples ranges between 1.1- $\mu\text{g/l}$ (MW-S8) and 17000- $\mu\text{g/l}$ (MW-S4). The results of analyses for three samples (MW-S4: 17000- $\mu\text{g/l}$, MW-S6: 53- $\mu\text{g/l}$, and PZ-S18: 6.6- $\mu\text{g/l}$) exceed the established, Pennsylvania, Medium Specific Concentration (*MSC*) for a Non-Use, Non-Residential Aquifer (*NU N R A*) for *PCBs*, that *MSC* value being 4.3- $\mu\text{g/l}$ (*MSC* data for a *NU N R A* is included on **TABLE 4**, for purposes of comparison.).

Samples collected from seven of the eight **overburden groundwater monitoring** wells contained *TOC*. However, the *TOC* concentration was "not reported" for the sample collected from well **PZ-S19**. Concentration of *TOC* in these seven samples ranges between 3.3-mg/l (MW-S1) and 17-mg/l (MW-S4). These results are consistent with "historical results" of analyses for this parameter from the **overburden groundwater monitoring wells**, in regards to *TOC* occurrence and concentration.

○ Samples collected from five (MW-S4, MW-S6, MW-S8, PZ-S18 and PZ-S19) of the eight **overburden groundwater monitoring** wells contained concentrations of "various" (**eight** "separate / different" *VOCs*) *VOCs*. Samples collected from **three** wells, MW-S1, MW-S9A, and MW-S10, however, did **not** test positively for the occurrence of *VOCs*. Again, generally, it appears that these analytical results are in agreement with "historical" data for the **overburden groundwater monitoring wells**, in regards to *VOC* occurrence and concentration.

The following eight *VOCs* "occurred" in samples collected from the five overburden wells:

- 1- acetone (MW-S6),
- 2- benzene (MW-S4),
- 3- carbon disulfide (MW-S4),
- 4- chlorobenzene (MW-S4, PZ-S18),
- 5- cis-1,2-Dichloroethene (MW-S4, MW-S6, MW-S8, PZ-S18, PZ-S19),
- 6- tetrachloroethene (MW-S6, MW-S8),
- 7- trichloroethene (MW-S8), and
- 8- vinyl chloride (MW-S6, PZ-S18).

Analytical results for the samples can be compared to the established, Pennsylvania, *MSC* data for a *NU NR A* in **TABLE 4**. However, the following is a summary of *exceedances* of the established, Pennsylvania, *MSC* data for a *NU NR A* for each volatile constituent:

- 1- **acetone** (*MSC* 100,000- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 2- **benzene** (*MSC* 500- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 3- **carbon disulfide** (*MSC* 4,100- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 4- **chlorobenzene** (*MSC* 10,000- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 5- **cis-1,2-Dichloroethene** (*MSC* 700- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 6- **tetrachloroethene** (*MSC* 50- $\mu\text{g/l}$) - One analytical result exceeds the *MSC* data for a *NU NR A*, (MW-S8),
- 7- **trichloroethene** (*MSC* 50- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 8- **vinyl chloride** (*MSC* 20- $\mu\text{g/l}$) - Two analytical results exceed the *MSC* data for a *NU NR A*, (MW-S6, PZ-S18).

SHALLOW BEDROCK ZONE

Analytical results for samples collected from the **eleven shallow bedrock groundwater monitoring wells** are summarized in **TABLE 5** (three pages). As with the overburden groundwater monitoring wells, groundwater samples collected from each of the **eleven shallow bedrock monitoring wells** are analyzed for the occurrence of *TPH*, *PCBs*, *TOC*, and *VOCs*. Samples were collected from the following eleven overburden wells: **MW-D1, PZ-D2, MW-D4, MW-D6, PZ-D7, MW-D8, MW-D9A, MW-D15, MW-D16, PZ-D18, and PZ-D19.**

DRO was detected in samples collected from six of the eleven **shallow bedrock groundwater monitoring wells**. Concentration of *DRO* in these samples ranges between 2.2- $\mu\text{g/l}$ (MW-D15) and 18- $\mu\text{g/l}$ (MW-D6). *GRO* was detected in samples collected from three of the eleven **shallow bedrock groundwater monitoring wells**. Concentration of *GRO* in these samples ranges between 1.2- $\mu\text{g/l}$ (MW-D6) and 5.0- $\mu\text{g/l}$ (PZ-D18).

PCBs were detected in samples collected from seven of the eleven **shallow bedrock groundwater monitoring** wells sampled. However, the PCB concentration was **not** evaluated in the sample collected from well **PZ-S19**. Concentration of PCBs ("exclusively" Aroclor 1260) in these seven samples ranges between 2.4- $\mu\text{g/l}$ (PZ-D7) and 65000- $\mu\text{g/l}$ (MW-D8). The results of analyses for four samples (MW-D6: 420- $\mu\text{g/l}$, MW-D8: 65000- $\mu\text{g/l}$, MW-D16: 390- $\mu\text{g/l}$, and PZ-D18: 75- $\mu\text{g/l}$) exceed the established, Pennsylvania, MSC for a *NU N R A* for PCBs, that MSC value being 4.3- $\mu\text{g/l}$ (MSC data for a *NU N R A* is included on **TABLE 5**, for purposes of comparison.).

Samples collected from ten of the eleven **shallow bedrock groundwater monitoring** wells contained TOC. The TOC concentration was "non detect" (< 1.0-mg/l) in the sample collected from well **PZ-D19**. Concentration of TOC in these ten samples ranges between 3.5-mg/l (MW-D1) and 13-mg/l (MW-D15). These results are consistent with "historical results" of analyses for this parameter from the **shallow bedrock groundwater monitoring wells**, in regards to TOC occurrence and concentration.

Samples collected from nine (PZ-D2, MW-D4, MW-D6, MW-D8, MW-D9A, MW-D15, MW-D16, PZ-D18 and PZ-D19) of the eleven **shallow bedrock groundwater monitoring** wells contained concentrations of "various" (**nine** "separate / different" VOCs) VOCs. Samples collected from **two** wells, MW-D1 and PZ-D7, however, did **not** test positively for the occurrence of VOCs. Again, generally, it appears that these analytical results are in agreement with "historical" data for the **shallow bedrock groundwater monitoring wells**, in regards to VOC occurrence and concentration.

The following nine VOCs "occurred" in samples collected from the nine shallow bedrock wells:

- 1- acetone (MW-D15, MW-D16),
- 2- benzene (MW-D4, MW-D6, MW-D8, PZ-D18, PZ-D19),
- 3- carbon disulfide (MW-D9A, MW-D15, MW-D16),
- 4- chlorobenzene (MW-D4, MW-D6, MW-D8, MW-D16, PZ-D18, PZ-D19),

- 5- **cis-1,2-Dichloroethene** (PZ-D2, MW-D4, MW-D8, MW-D16, PZ-D18, PZ-D19),
- 6- **trans-1,2-Dichloroethene** (MW-D8, MW-D16),
- 7- **tetrachloroethene** (PZ-D2, MW-D8, PZ-D18),
- 8- **trichloroethene** (PZ-D2, MW-D8, PZ-D18), and
- 9- **vinyl chloride** (MW-D4, MW-D8, MW-D16, PZ-D18, PZ-D19).

Analytical results for the samples can be compared to the established, Pennsylvania, *MSC* data for a *NU NR A* in **TABLE 5**. However, the following is a summary of *exceedances* of the established, Pennsylvania, *MSC* data for a *NU NR A* for each volatile constituent:

- 1- **acetone** (*MSC* 100,000- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 2- **benzene** (*MSC* 500- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 3- **carbon disulfide** (*MSC* 4,100- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 4- **chlorobenzene** (*MSC* 10,000- $\mu\text{g/l}$) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 5- **cis-1,2-Dichloroethene** (*MSC* 700- $\mu\text{g/l}$) - One analytical result exceeds the *MSC* data for a *NU NR A* (MW-D8),
- 6- **trans-1,2-Dichloroethene** - No analytical results exceed the *MSC* data for a *NU NR A*,
- 7- **tetrachloroethene** (*MSC* 50- $\mu\text{g/l}$) - Three analytical results exceed the *MSC* data for a *NU NR A*, (PZ-D2, MW-D8, PZ-D18),
- 8- **trichloroethene** (*MSC* 50- $\mu\text{g/l}$) - Two analytical results exceed the *MSC* data for a *NU NR A*, (MW-D8, PZ-D18),
- 9- **vinyl chloride** (*MSC* 20- $\mu\text{g/l}$) - Five analytical results exceed the *MSC* data for a *NU NR A*, (MW-D4, MW-D8, MW-D16, PZ-D18, PZ-D19).

DEEP BEDROCK ZONE

Analytical results for ground water samples collected from the **four deep bedrock groundwater monitoring wells** are summarized in **TABLE 6** (one page). As with the overburden and shallow bedrock groundwater monitoring wells, the samples collected from each of the four deep bedrock monitoring wells are analyzed for the occurrence of *TPH*, *PCBs*, *TOC* and *VOCs*. Samples were collected from the following four deep bedrock wells: **MW-9**, **MW-11** (two

samples collected for quality control purposes, **MW-11a and MW-11b**), **MW-12** and **PZ-D14**.

Neither *DRO* nor *GRO* was detected in samples collected from the four **deep bedrock groundwater monitoring wells**. It appears that these analytical results are in general agreement with "historical" data for the **deep bedrock groundwater monitoring wells**, in regards to *TPH* occurrence and concentration.

PCBs were detected in samples collected from one of the quality control samples (**MW-11b**) and the sample collected from well **MW-12**. The samples collected from monitoring wells **MW-9** and **PZ-D14** and the quality control sample **MW-11a** were "**non detect**" ($< 1.0\text{-}\mu\text{g/l}$) for the occurrence of *PCBs*. The concentration of *PCBs* ("exclusively" Aroclor 1260) in these two samples is $1.1\text{-}\mu\text{g/l}$ (**MW-11b**) and $2.0\text{-}\mu\text{g/l}$ (**MW-12**), respectively. However, these analytical results do **not** exceed the established, Pennsylvania, *MSC* for a *NU NR A* for *PCBs*, that *MSC* value being $4.3\text{-}\mu\text{g/l}$ (*MSC* data for a *NU NR A* is included on **TABLE 6**, for purposes of comparison.). Again, it appears that these analytical results are in general agreement with "historical" data for the **deep bedrock groundwater monitoring wells**, in regards to *PCB* occurrence and concentration.

Samples collected from each of the four **deep bedrock groundwater monitoring wells** contained *TOC*. The concentration of *TOC* in these four samples ranges between 2.1-mg/l (**MW-11b**) and 17-mg/l (**PZ-D14**). These results are consistent with "historical results" of analyses for this parameter from the **deep bedrock groundwater monitoring wells**, in regards to *TOC* occurrence and concentration.

Three samples tested "positively" for the occurrence of "only one" *VOC-carbon disulfide*: **MW-11a** ($33\text{-}\mu\text{g/l}$), **MW-11b** ($26\text{-}\mu\text{g/l}$), and **MW-12** ($7.7\text{-}\mu\text{g/l}$). The sample collected from well **MW-9** and **PZ-14** were "**non detect**" ($< 5.0\text{-}\mu\text{g/l}$ and / or $< 10.0\text{-}\mu\text{g/l}$, depending upon the specific analyte) for the occurrence of all "other" *VOCs*. The concentration of **carbon disulfide** in each of well **MW-11a**, **MW-11b**, and **MW-12** is well below the established, Pennsylvania,

MSC concentration for **carbon disulfide** for a *NU NR A*, that value being **4,100-μg/l**. These analytical results are also consistent with “historical results” of analyses for this parameter from the **deep bedrock groundwater monitoring wells**, in regards to *VOC* occurrence and concentration.

STREAM CHEMISTRY - CHARTIERS CREEK

Three surface water, *stream samples* are collected at designated, surveyed, sample points situated along the northwestern bank of *Chartiers Creek* as part of the **E-O-Y, 2003** event. The locations of the three stream, sampling points are depicted on **FIGURE 2**. One sample (**Upstream Sample # 1**) is collected from a point situated upstream of the monitoring network site. A second sample (**Upstream Sample # 2**) is collected from a point situated upstream of Outfalls 001, 003, and 004, which are clustered at a location along the bank of Chartiers Creek, “within” the monitoring network. And, the third sample (**Downstream Sample**) is collected from a point situated downstream of the Outfalls, also, generally “within” the monitoring network. .

Analytical results for the **three stream samples** are summarized in **TABLE 7** (one page). As with the overburden, shallow bedrock, and deep bedrock groundwater monitoring wells, the stream samples are analyzed for the occurrence of *TPH*, *PCBs*, *TOC*, and *VOCs*.

Neither *DRO* nor *GRO* was detected in the three *stream samples* collected from *Chartiers Creek*. Additionally, *PCBs* were **not** detected in the three *stream samples* collected from *Chartiers Creek*. These analytical results are in general agreement with “historical” data for the *Chartiers Creek stream samples*, in regards to both *TPH* and *PCB* occurrence and concentration.

Samples collected from each of the three *Chartiers Creek stream sample* locations contained / “tested positively” for the occurrence of *TOC*. The concentration of *TOC* in these three samples is, respectively: **2.7-mg/l** Downstream Sample # 1, **2.6-mg/l** Upstream Sample # 1, and **2.4-mg/l** Upstream Sample # 2. These results are consistent with “historical results” of analyses for this

parameter from the *Chartiers Creek steam samples*, in regards to *TOC* occurrence and concentration. *VOCs* were **not** observed in any of the three *Chartiers Creek steam samples*. Again, these analytical result are consistent with "historical results" of analyses for this parameter from the *Chartiers Creek steam samples*, in regards to *VOC* occurrence and concentration.

TREATMENT SYSTEM INFLUENT AND CARBON FILTRATION SYSTEM

Four samples were successfully collected from the carbon filtration / treatment system. The treatment system is located inside Building 90 in the **B20 / 25A** monitoring network. Samples are collected at selected points in the treatment system to evaluate and monitor the carbon units for potential "breakthrough"; and, thereby, assist in the prevention of possible exceedance of discharge limits. The four samples are "typically / historically" collected at the following points in the treatment system:

- 1- at a point located before the oil / water treatment system, (*Before Treatment System*),
- 2- between the first (PC1) and second (PC2) carbon units (*Between PC1 and PC2*),
- 3- at the midpoint of the treatment system (*Midpoint Of Treatment System*), and
- 4- between the third (PC3) and fourth (PC4) carbon units (*Between PC3 and PC4*).

Results of analyses conducted on the **four treatment system samples** are summarized in *TABLE 8* (one page). As with the overburden, shallow bedrock, and deep bedrock groundwater monitoring wells and the Chartiers Creek stream samples, the treatment system samples are analyzed for the occurrence of *TPH*, *PCBs*, *TOC*, and *VOCs*.

Neither *DRO* nor *GRO* was detected in any of the four *treatment system samples*. Additionally, *PCBs* were **not** detected in any of the four *treatment system samples*. These analytical results are in general agreement with "historical" data for the *treatment system samples*, in regards to both *TPH* and *PCB* occurrence and concentration.

Samples collected from three of the four *treatment system sample* points contained *TOC*. The

concentration of *TOC* in the four *treatment system samples* is, respectively, 4.2-mg/l: Before Treatment System, 1.0-mg/l: Between PC1 and PC2, < 1.0-mg/l-“non detect”: Midpoint of Treatment System, and 1.1-mg/l: Between PC3 and PC4. These results are consistent with “historical results” of analyses for this parameter from the *treatment system samples*, in regards to *TOC* occurrence and concentration.

Samples collected from three (Before Treatment System, Between PC1 and PC2, and Between PC3 and PC4) of the four *treatment system sample* points contained / “tested positively” for the concentration of “various” (**three** “separate / different” *VOCs*) *VOCs*. The sample collected from the Midpoint of the Treatment System, however, did **not** test positively (**non detect**)for the occurrence of *VOCs*. Again, generally, it appears that these analytical results are in agreement with “historical” data for the *treatment system sample* points, in regards to *VOC* occurrence and concentration.

The following three *VOCs* “occurred” in samples collected from three of the four *treatment system sample* points:

- 1- **acetone** (Before Treatment System),
- 2- **2-Butanone** (Between PC1 and PC2 and Between PC3 and PC4), and
- 3- **carbon disulfide** (Between PC3 and PC4).

None of the results exceed the *MSC* value. Analytical results for the samples can be compared to the established, Pennsylvania, *MSC* data for a *NU NR A* in **TABLE 8**. However, the following is a summary of *exceedances* of the established, Pennsylvania, *MSC* data for a *NU NR A* for each volatile constituent:

- 1- **acetone** (*MSC* 100,000-µg/l) - No analytical results exceed the *MSC* data for a *NU NR A*,
- 2- **2-Butanone** (*MSC* Non Regulated Substance), and
- 3- **carbon disulfide** (*MSC* 4,100-µg/l) - No analytical results exceed the *MSC* data for a *NU NR A*.

OVERVIEW OF TREATMENT SYSTEM OPERATIONS

The groundwater recovery and treatment system consists of an interceptor trench and a series of groundwater recovery wells, which are utilized for the collection of contaminated groundwater and floating product from the overburden and shallow bedrock horizons. The recovery system serves as a barrier to the horizontal migration of contaminated groundwater in the overburden and shallow bedrock horizons to Chartiers Creek. The recovery system is also designed to prevent the vertical migration of contaminated groundwater into deeper bedrock horizons. The groundwater collected by the system is pumped to the groundwater treatment system (**003 System**). The treated effluent is ultimately discharged to Chartiers Creek via **Outfall 003**. Discharge parameters are established in accordance with National Pollutant Discharge Elimination System Permit **PA0001937**. A copy of this permit is maintained by *PTTI* and is available for review upon request.

Currently, the recovery system contains ten "components" within the **B20 / 25A** network area. Those ten "components" are comprised of the following:

- 1- *three interceptor trench recovery sumps* (**TS-1**, **TS-4**, and **TS-7**),
- 2- *three bedrock recovery locations* (**BR-1**, **BR-2**, and **BR-3**),
- 3- *one steam tunnel recovery location* (**ST**),
- 4- *two recovery sumps* (**RS-1** and **RS-2**), and
- 5- *one recovery well* (**MW-5 / RS-5**), which is located inside Building 25.

The location of the principal "components" of the groundwater recovery system are depicted in **FIGURE 2**.

Although not required by the *COA*, groundwater monitoring wells **MW-S15** and **MW-S16** were "hand-bailed" quarterly between the second quarter, 1994 and first quarter, 2000. "Hand-bailing" was initiated to further remove product from the groundwater regime-particularly, the floating layer of liquid hydrocarbon-*LNAPL* that occurs in each of these wells. Historically, the greatest recorded hydrocarbon thickness at these two monitoring well locations was **1.3-feet** at **MW-S15** and **3.0-feet** at **MW-S16**. As was noted previously in this report-for the current, **E-O-Y, 2003**

event, monitoring well **MW-S15** exhibited an approximate **0.10-foot** thick *LNAPL* layer on the water table, and monitoring well **MW-S16** exhibited an approximate **0.37-foot** thick *LNAPL* layer on the water table. Free product, hydrocarbon thickness at each of these monitoring wells has been reduced, conservatively, between 85 and 95 percent since the initiation of both hand-bailing and product recovery processes.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- 1- Groundwater within the overburden and shallow bedrock horizons generally “flows toward” Chartiers Creek. However, it appears that the recovery system has an effect upon groundwater flow direction-particularly in the overburden flow regime. A mapable “groundwater sink” occurs in proximity to recovery well MW-S5 / RS-5; the feature is particularly prominent in the overburden groundwater regime, where the elevation of the groundwater table in the overburden regime is lowered about ten feet (between about 914 and 904 feet above MSL). The “sink is caused by pumping activity in the recovery well. The groundwater elevation in the shallow bedrock regime is less severely affected. However, shallow bedrock groundwater elevation is lowered by between two and three feet (between about 916 and 913 feet above MSL) in proximity to this recovery well. As was mentioned previously, the recovery well-MW-S5 / RS-5, is located “inside” Building 25.
- 2- The localized *LNAPL* layer in proximity to monitoring wells MW-S15, MW-S16, and MW-S5 / RS-5 has been significantly reduced-conservatively by at least 80 percent, over the past decade of pumping and groundwater treatment. The thickness of the hydrocarbon layer in proximity to monitoring wells MW-S15, MW-S16, and MW-S5 / RS-5 is approaching zero, ranging between 0.10 and 0.37 feet thick. However, minor fluctuations in thickness are the “historical” norm as observed by semi-annual monitoring.
- 3- It appears that the groundwater recovery system continues to collect and effectively treat contaminated groundwater. Apparently, less groundwater is “delivered” to the treatment system, at “low precipitation periods” throughout the year. This is manifested by the difficulty

that occurs when attempting to obtain sufficient sample volume for the samples collected for chemical analyses from the treatment system, particularly during the mid-year sampling event. "Low precipitation periods" correlate with a "lowering of the groundwater table"-in both the overburden and shallow bedrock groundwater regimes.

RECOMMENDATIONS

Based upon the results of the **E-O-Y, 2003** event, comprehensive groundwater compliance monitoring for the **B20 / 25A** network, several recommendations for future compliance activity are offered for consideration.

- 1- It is recommended that ten components of the recovery system within the **B20 / 25A** network be "serviced" / "evaluated" on-at least, an annual basis. No maintenance records are available for the "working components" of the system. The effectiveness of the ten components of the recovery system must be quantified on, at least, an annual basis. The evaluation would include "pulling", down-hole pumps for maintenance and inspection, as well as the inspection of transmission lines.
- 2- All monitoring and observation wells in the network should be "worked-over" / "cleaned". This is recommended due to the age of the wells, location of the wells in proximity to "traffic" at the site, as well as the types of product (particularly *LNAPL*) "collected" by the wells.
- 3- Several of the observation wells in the **B20 / 25A** network require "new" well caps and gaskets-particularly the wells that are "flush" with the ground surface. Well MW-S10 is particularly "vulnerable; it is located in the middle of the "dirt road" on the western "edge" of the **B20 / 25A** network. Well maintenance and replacement of selected "hardware" should be completed before the December event.
- 4- *PTTI* representatives may also want to consider "replacing" (re-drilling) the wells that have been "damaged / lost" over the past decade. The attrition of data points (monitoring and sampling sites) could continue from increased traffic throughout the site. A total of three

monitoring wells / sampling points have been “damaged / lost”, including, wells MW-S3, MW-D3, and PZ-S7. Additionally, several wells are “vulnerable” in the area where Rieger Crane Company “parks and mobilizes” its equipment, particularly, wells MW-S1, MW-D1, and MW-S10.

- 5- PTTI representatives may want to consider placing several, additional monitoring wells off-site in order to gauge the effectiveness of the recovery system over time, as well as evaluate the off-site migration of the contaminant plume away from the monitoring network.
- 6- The “manual” hand-bailing removal of product at monitoring wells MW-S15, MW-S16, and MW-S5 / RS-5 has “historically” reduced the localized LNAPL “layer” in proximity to these monitoring wells. As was mentioned in the *M-Y, 2003 Compliance Monitoring Sampling Event Report*, a method to further reduce the occurrence of LNAPL would be to utilize a vacuum truck to “remove” product and groundwater from each of the two wells that do not contain recovery pumps, MW-S15 and MW-S16. The effects of “vacuum removal” could also be monitored in wells situated in close proximity to these two wells. It is felt that this type of proactive approach could help “speed-up” the remediation process at a relatively minor cost-compared to longer term monitoring and sampling.
- 7- As was also mentioned in the *M-Y, 2003 Compliance Monitoring Sampling Event Report*, the use of a vacuum truck to “remove” product and contaminated groundwater from wells in the B20 / 25A network could be conducted on a monthly basis for the six-month period prior to a scheduled, semiannual monitoring event. The effectiveness of this product recovery / removal method could be quantified based upon an evaluation of the data generated from the scheduled, monitoring event. Hydrocarbon thickness, results of chemical analyses, and field stabilization information should be impacted (“hopefully positively”) by the removal of product and contaminated groundwater with a vacuum truck. It is felt that this type of proactive approach could help “speed-up” the remediation process at a relatively minor cost-compared to longer term monitoring and sampling.

TABLES

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

LIST OF TABLES

- TABLE 1** Summary - Groundwater Monitoring / Sampling Schedule
- TABLE 2** Selected Well Information - Including: Groundwater Depth, Elevation, Thickness Of Water Column In Well, and Liquid Hydrocarbon Occurrence (*LNAPL*) (Three Pages)
- TABLE 3** Groundwater Chemistry Data - Quality Assurance / Quality Control Samples
- TABLE 4** Groundwater Chemistry Data - Overburden Wells (Two Pages)
- TABLE 5** Groundwater Chemistry Data - Shallow Bedrock Wells (Three Pages)
- TABLE 6** Groundwater Chemistry Data - Deep Bedrock Wells
- TABLE 7** Groundwater Chemistry Data - Chartiers Creek - Stream Samples
- TABLE 8** Groundwater Chemistry Data - Treatment System Influent and Carbon Filtration System

TABLE 1

page 1 of 1

SUMMARY

GROUNDWATER MONITORING / SAMPLING SCHEDULE

<u>Well Identification</u>	<u>Liquid Level Measurement Frequency</u> ⁽¹⁾	<u>Type of Groundwater Measurement / Sample</u> ⁽²⁾	<u>Historical LNAPL Observation</u> ⁽³⁾
<u>Overburden Wells</u>			
1- MW-S1	Semiannual	Semiannual	None
2- MW-S3 ⁽⁴⁾	<i>Well Lost</i>	<i>Well Lost</i>	<i>Well Lost</i>
3- MW-S4	Semiannual	Semiannual	<i>Sheen</i>
4- MW-S5 / R-5	Semiannual	<i>Not Sampled</i>	<i>Measurable Layer</i>
5- MW-S6	Semiannual	Semiannual	<i>Slight Sheen</i>
6- PZ-S7	<i>Well Lost</i>	<i>Well Lost</i>	<i>Well Lost</i>
7- MW-S8	Semiannual	Semiannual	None
8- MW-S9A	Semiannual	Semiannual	None
9- MW-S10	Semiannual	Semiannual	None
10- MW-S15	Semiannual	<i>Not Sampled</i>	<i>Measurable Layer</i>
11- MW-S16	Semiannual	<i>Not Sampled</i>	<i>Measurable Layer</i>
12- PZ-S18	Semiannual	Annual	None
13- PZ-S19	Semiannual	Annual	None
<u>Shallow Bedrock Wells</u>			
14- MW-D1	Semiannual	Semiannual	<i>Slight Sheen</i>
15- PZ-D2	Semiannual	Annual	<i>Slight Sheen</i>
16- MW-D3 ⁽⁴⁾	<i>Well Lost</i>	<i>Well Lost</i>	<i>Well Lost</i>
17- MW-D4	Semiannual	Semiannual	<i>Slight Sheen</i>
18- MW-D5 ⁽⁵⁾	None (Dropped From Monitoring Program)	(Dropped From Monitoring Program)	<i>Sheen</i>
19- MW-D6	Semiannual	Semiannual	<i>Slight Sheen</i>
20- PZ-D7	Semiannual	Annual	None
21- MW-D8	Semiannual	Semiannual	<i>Slight Sheen</i>
22- MW-D9A	Semiannual	Semiannual	None
23- MW-D15	Semiannual	Semiannual	<i>Slight Sheen</i>
24- MW-D16	Semiannual	Semiannual	<i>Slight Sheen</i>
25- PZ-D18	Semiannual	Annual	None
26- PZ-D19	Semiannual	Annual	None
<u>Deep Bedrock Wells</u>			
27- MW-9	Semiannual	Semiannual	None
28- MW-11	Semiannual	Semiannual	None
29- MW-12	Semiannual	Semiannual	None
30- PZ-D14	Semiannual	Annual	None

NOTES:

- (1) The groundwater level in each monitoring well is gauged semiannually (two times per year)-during both the *Mid Year* and *End Of Year* Monitoring / Sampling Events.
- (2) Each monitoring well is sampled annually (one time per year)-normally during the *End Of Year* Monitoring / Sampling Event. Selected monitoring wells are sampled two times per year (semiannually)-during both the *Mid Year* and *End Of Year* Monitoring / Sampling Event. Monitoring wells that "historically" contain "standing product" (LNAPL) are *not sampled*.
- (3) "Historical" is defined as the previous two monitoring events: End Of Year 2002 (DEC, 2002) and Mid Year 2003 (JUL, 2003)
- (4) These wells (MW-S3, MW-D3, and PZ-D7) have been "lost / damaged" and can no longer be utilized for either monitoring or sampling.
- (5) MW-D5 was previously dropped from the monitoring program because the well does not communicate with the shallow bedrock and also because down gradient well MW-D6 accurately determines extent of shallow bedrock groundwater contamination. This well has "historically" exhibited a *sheen* of NAPL-"pre" Mid Year and End Of Year, 2000 events.

**SELECTED WELL INFORMATION - INCLUDING: GROUNDWATER DEPTH, ELEVATION,
THICKNESS OF WATER COLUMN IN WELL, AND LIQUID HYDROCARBON OCCURRENCE (LNAPL)**

OVERBURDEN WELLS

<u>WELL #</u> (1)	<u>MONT /</u> <u>BAILED</u> (Dates-2003) (2)	<u>TOC</u> <u>ELEV</u> (ft) (3)	<u>DEPTH</u> <u>TOC TO WL</u> (ft) (4)	<u>WATER ELEV</u> <u>DEC 15, 18, 19,</u> <u>or 22, 2003</u> (ft) (5)	<u>TOTAL</u> <u>DEPTH</u> (ft) (6)	<u>THK WATER COL</u> (ft) (EQUIV GALS) <u>VOLUME BAILED</u> (7)	<u>LNAPL</u> <u>2003 EVENT-MY</u> <u>2003 EVENT-EOY</u> (8)
1- MW-S1	12 / 19 - 12 / 19	929.90	8.29 7.52	922.38	13.32	5.80 (0.98 gal) 3.5 gal	NONE on 07 / 07 / 03 NONE on 12 / 19 / 03
2- MW-S3	HOLE LOST- DAMAGED	926.53	NA	NA	NA	NA	HOLE LOST- DAMAGED
3- MW-S4	12 / 15 - 12 / 17	926.20	8.28 7.98	918.29	15.4	7.42 (1.26 gal) 3.5 gal	SHEEN on 07 / 07 / 03 SHEEN on 12 / 17 / 03
4- MW-S5 / RS-5	12 / 15 - NSEYOY RECOVERY PUMP	911.30	7.31 7.55	903.75	9.50	1.95 (0.35 gal) Not Bailed	0.11' on 07 / 07 / 03 0.13' on 12 / 15 / 03
5- MW-S6	12 / 19 - 12 / 19	926.46	10.37 9.75	916.71	13.15	3.57 (0.61 gal) 2.0 gal	S SHN on 07 / 07 / 03 S SHN on 12 / 19 / 03
6- PZ-S7	HOLE LOST- CAN NOT BE FOUND	924.34	NA	NA	NA	NA	HOLE LOST- CAN NOT BE FOUND
7- MW-S8	12 / 15 - 12 / 19	928.06	11.67 10.32	917.74	15.65	5.33 (0.91 gal) 6.0 gal	NONE on 07 / 07 / 03 NONE on 12 / 19 / 03
8- MW-S9A	12 / 18 - 12 / 18	926.20	10.46 9.82	916.38	12.10	2.28 (0.39 gal) Not Bailed	NONE on 07 / 07 / 03 NONE on 12 / 18 / 03
9- MW-S10	12 / 22 - 12 / 22	930.36	5.96 4.48	925.88	8.60	8.84 (1.50 gal) 3.0 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03
10- MW-S15	12 / 15 - NSEYOY	925.80	6.81 7.04	918.76	13.0	5.96 (1.01 gal) Not Bailed	0.08' on 07 / 07 / 03 0.10' on 12 / 15 / 03
11- MW-S16	12 / 15 - NSEYOY	926.10	7.61 7.88	918.22	12.9	5.02 (0.85 gal) Not Bailed	0.24' on 07 / 07 / 03 0.37' on 12 / 15 / 03
12- PZ-S18	12 / 22 - 12 / 22	931.40	17.07 16.83	914.57	18.67	1.84 (0.32 gal) 1.5 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03
13- PZ-S19	12 / 22 - 12 / 22	931.30	16.12 15.96	915.34	19.38	3.42 (0.58 gal) 1.5 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03

SHALLOW BEDROCK WELLS

14- MW-D1	12 / 22 - 12 / 22	929.99	9.93 8.86	921.13	28.4	19.54 (3.32 gal) 6.0 gal	S SHN on 07 / 07 / 03 S SHN on 12 / 22 / 03
15- PZ-D2	12 / 15 - 12 / 18	933.68	11.28 8.29	925.39	23.2	14.91 (2.53 gal) 7.5 gal	S SHN on 07 / 07 / 03 S SHN on 12 / 18 / 03

**SELECTED WELL INFORMATION - INCLUDING: GROUNDWATER DEPTH, ELEVATION,
THICKNESS OF WATER COLUMN IN WELL AND LIQUID HYDROCARBON OCCURRENCE (LNAPL)**

SHALLOW BEDROCK WELLS *continued*

<u>WELL #</u> (1)	<u>MONT / BAILED</u> (Dates-2003) (2)	<u>TOC ELEV</u> (ft) (3)	<u>DEPTH TOC TO WL</u> (ft) (4)	<u>WATER ELEV DEC 15, 18, 19, or 22, 2003</u> (ft) (5)	<u>TOTAL DEPTH</u> (ft) (6)	<u>THK WATER COL</u> (ft) (EQUIV GALS) <u>VOLUME BAILED</u> (7)	<u>LNAPL</u> <u>2003 EVENT-MY</u> <u>2003 EVENT-EOY</u> (8)
16- MW-D3	HOLE LOST- DAMAGED	926.51	NA	NA	NA	NA	HOLE LOST- DAMAGED
17- MW-D4	12 / 15 - 12 / 17	926.20	11.05 10.38	915.82	33.80	23.42 (3.98 gal) 4.5 gal	<i>S SHN</i> on 07 / 07 / 03 <i>S SHN</i> on 12 / 17 / 03
18- MW-D5	HOLE DROPPED	926.07	Dropped from Mont Program	Dropped from Mont Program	NA	Dropped from Mont Program	Dropped from Mont Program
19- MW-D6	12 / 17 - 12 / 19	926.07	11.20 10.79	915.28	31.80	21.01 (3.57 gal) 6.5 gal	<i>S SHN</i> on 07 / 07 / 03 <i>S SHN</i> on 12 / 19 / 03
20- PZ-D7	12 / 22 - 12 / 22	924.46	10.78 10.71	913.75	32.55	21.84 (3.71 gal) 7.0 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03
21- MW-D8	12 / 15 - 12 / 19	927.82	17.11 16.71	911.11	28.70	11.99 (2.38 gal) 5.5 gal	<i>S SHN</i> on 07 / 07 / 03 <i>S SHN</i> on 12 / 19 / 03
22- MW-D9A	12 / 18 - 12 / 18	925.70	9.32 9.92	915.78	25.20	15.28 (2.59 gal) 6.5 gal	NONE on 07 / 07 / 03 NONE on 12 / 18 / 03
23- MW-D15	12 / 15 - 12 / 17	926.00	7.41 7.66	918.34	26.30	18.64 (3.17 gal) 6.0 gal	<i>S SHN</i> on 07 / 07 / 03 <i>S SHN</i> on 12 / 17 / 03
24- MW-D16	12 / 15 - 12 / 17	925.25	11.91 11.57	913.68	29.90	18.33 (3.12 gal) 5.5 gal	<i>S SHN</i> on 07 / 07 / 03 <i>S SHN</i> on 12 / 17 / 03
25- PZ-D18	12 / 22 - 12 / 22	931.20	21.04 20.97	910.23	40.10	19.13 (3.25 gal) 9.0 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03
26- PZ-D19	12 / 22 - 12 / 22	931.10	22.31 21.92	909.18	30.68	8.76 (1.49 gal) 6.5 gal	NONE on 07 / 07 / 03 NONE on 12 / 22 / 03

DEEP BEDROCK WELLS

27- MW-9	12 / 15 - 12 / 18	926.20	8.61 8.82	917.38	85.00	76.18 (48.75 gal) 145 gal	NONE on 07 / 07 / 03 NONE on 12 / 18 / 03
28- MW-11	12 / 15 - 12 / 17	926.40	8.48 8.78	917.62	75.50	67.72 (42.70 gal) 145 gal	NONE on 07 / 07 / 03 NONE on 12 / 17 / 03
29- MW-12	12 / 15 - 12 / 19	930.40	13.66 14.06	916.34	91.00	76.94 (49.24 gal) 150 gal	NONE on 07 / 07 / 03 NONE on 12 / 19 / 03
30- PZ-D14	12 / 15 - 12 / 18	933.80	16.11 16.42	917.38	89.00	72.58 (48.75 gal) 130 gal	NONE on 07 / 07 / 03 NONE on 12 / 18 / 03

SELECTED WELL INFORMATION - INCLUDING: GROUNDWATER DEPTH, ELEVATION,
THICKNESS OF WATER COLUMN IN WELL AND LIQUID HYDROCARBON OCCURRENCE (LNAPL)

NOTES:

- (1) GROUNDWATER LEVELS WERE RECORDED IN 26 WELLS / GROUNDWATER SAMPLES WERE COLLECTED FROM 23 WELLS. (DUPLICATE SAMPLES WERE COLLECTED FROM WELL MW-11 FOR QUALITY ASSURANCE / QUALITY CONTROL PURPOSES). AN *ITALICIZED WELL NUMBER* INDICATES THAT A SAMPLE WAS COLLECTED FROM THE WELL. A **BOLD WELL NUMBER** INDICATES THAT THE WELL CONTAINS "STANDING PRODUCT".
- (2) DATE WELL WAS MONITORED AND BAILED / SAMPLED (*NSEOY* - WELL WAS NOT BAILED / SAMPLED, **END OF YEAR, 2003 EVENT**)
- (3) TOP OF CASING ELEVATION
- (4) DEPTH - TOP OF CASING TO WATER LEVEL IN THE WELL: **MIDDLE OF YEAR, 2003 EVENT AND END OF YEAR, 2003 EVENT (BOLD)**
- (5) ELEVATION OF WATER LEVEL IN THE WELL: **END OF YEAR, 2003 EVENT**
- (6) TOTAL DEPTH OF THE WELL
- (7) THICKNESS OF THE WATER COLUMN IN THE WELL AND THE EQUIVALENT GALLONS OF WATER IN THAT COLUMN VOLUME (GALLONS) OF WATER BAILED FROM THE WELL PRIOR TO SAMPLING
- (8) LIQUID HYDROCARBON OCCURRENCE (*SHEEN-S SHN* or **SHN** and / or *ACTUAL THICKNESS*) - **MIDDLE OF YEAR, 2003 EVENT (JULY, 2003) END OF YEAR, 2003 EVENT (DECEMBER, 2003)**

TABLE 3

page 1 of 1

GROUNDWATER CHEMISTRY DATA

QUALITY ASSURANCE / QUALITY CONTROL SAMPLES

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC NUA</u> ⁽⁶⁾	<u>PZ-11 a</u>	<u>PZ-11 b</u>	<u>EQUIPMENT BLANK</u>	<u>FIELD BLANK</u>	<u>TRIP BLANK</u>
T P H ⁽¹⁾	mg / l	Not Regulated	DRØ < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	(4)	(4)	(4)
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	1.1 (1.4)	(4)	(4)	(4)
TOC ⁽³⁾	mg / l	Not Regulated	2.6 (9.6) ⁽⁵⁾	2.1 (14)	(4)	(4)	(4)
Volatile Organics:							
Acetone	ug / l	100,000	<10	<10	<10	<10	18 (10)
Benzene	ug / l	500	<5.0	<5.0	<5.0	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	33 (<5)	26 (<5)	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	<5.0	<5.0	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:⁽¹⁾ Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)⁽²⁾ Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)⁽³⁾ Total Organic Carbon (/ Halogens)⁽⁴⁾ Parameter not reported⁽⁵⁾ Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event⁽⁶⁾ Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

TABLE 4

page 1 of 2

GROUNDWATER CHEMISTRY DATA OVERBURDEN WELLS

Parameter Tested	Units	PA MSC NUA ⁽⁷⁾	MW-S1	MW-S4	MW-S6	MW-S8
T P H ⁽¹⁾	Mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO 440 (15) GRO 2.6 (1.0)	DRO 32 (<1.0) GRO <1.0	DRO < 1.0 GRO < 1.0
PCB Total-TCL ⁽²⁾	Ug / l	4.3	<1.0 (<1.0) ⁽⁵⁾	17000 (39000)	53 (78)	1.1 (9.3)
TOC ⁽³⁾	mg / l	Not Regulated	3.3 (3.2)	17 (10)	4.9 (18)	8.1 (5.0)
Volatile Organics:						
Acetone	ug / l	100,000	<10	<10	23 (<10)	<10
Benzene	ug / l	500	<5.0	160 (87)	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	45 (<5.0)	<5.0	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	2100 (400)	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0 (13)	6.7 (6.0)	31 (14)
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	5.6 (<5.0)	110 (140)
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0	5.2 (6.3)
Vinyl chloride	ug / l	20	<5.0	<5.0	44 (25)	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0

Notes:

Eight Overburden Wells (of a total of 13) are sampled for chemical analyses for the **EOY, 2003** Sampling Event.

Five Overburden Wells are not sampled: MW-3 (lost), PZ-S7 (lost), and MW-S5/RS-5, MW-S15, MW-S16, (standing product).

(1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)

(2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)

(3) Total Organic Carbon (/ Halogens)

(4) Parameter not reported

(5) Value in parentheses represents analytical results for the parameter from the **MY, 2003** Sampling Event

(6) Well is not sampled during the **MY, 2003** Sampling Event

(7) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

TABLE 4

page 2 of 2

GROUNDWATER CHEMISTRY DATA

OVERBURDEN WELLS

Parameter Tested	Units	PA MSC NUA ⁽⁷⁾	MW-S9A	MW-S10	PZ-S18 ⁽⁶⁾	PZ-S19 ⁽⁶⁾
T P H ⁽¹⁾	mg / l	Not Regulated	DRO 1.2 (<1.0) GRO <1.0	DRO <1.0 GRO <1.0	DRO 1.4 (<1.0) GRO <1.0	DRO <1.0 GRO <1.0
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	<1.0	6.3 ⁽⁶⁾	<1.0
TOC ⁽³⁾	mg / l	Not Regulated	14 (15) ⁽⁵⁾	12 (13)	6.6 ⁽⁶⁾	(4)
Volatile Organics:						
Acetone	ug / l	100,000	<10	<10	<10	<10
Benzene	ug / l	500	<5.0	<5.0	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	18 ⁽⁶⁾	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0	47 ⁽⁶⁾	16 ⁽⁶⁾
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	42 ⁽⁶⁾	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0

Notes:

Eight Overburden Wells (of a total of 13) are sampled for chemical analyses for the **EOY, 2003** Sampling Event.

Five Overburden Wells are not sampled: MW-3 (lost), PZ-S7 (lost), and MW-S5/RS-5, MW-S15, MW-S16, (standing product).

(1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)

(2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)

(3) Total Organic Carbon (/ Halogens)

(4) Parameter not reported

(5) Value in parentheses represents analytical results for the parameter from the **MY, 2003** Sampling Event

(6) Well is **not** sampled during the **MY, 2003** Sampling Event

(7) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

GROUNDWATER CHEMISTRY DATA

SHALLOW BEDROCK WELLS

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC NUA ⁽⁷⁾</u>	<u>MW-D1</u>	<u>PZ-D2 ⁽⁶⁾</u>	<u>MW-D4</u>	<u>MW-D6</u>
T P H ⁽¹⁾	mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO 2.4 (4.2) GRO 5.0 (3.5)	DRO 18 (11) GRO 1.2 (<1.0)
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	<1.0	3.2 (3.8)	420 (1800)
TOC ⁽³⁾	mg / l	Not Regulated	3.5 (4.4) ⁽⁵⁾	5.9 ⁽⁶⁾	7.9 (7.1)	12 (11)
Volatile Organics:						
Acetone	ug / l	100,000	<10	<10	<10	<10
Benzene	ug / l	500	<5.0	<5.0	310 (320)	6.9 (<5.0)
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	1800 (1500)	790 (620)
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	36 ⁽⁶⁾	280 (380)	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	70 ⁽⁶⁾	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	6.9 ⁽⁶⁾	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	75 (47)	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0

Notes:

Eleven Shallow Bedrock Wells (of a total of 13) are sampled for chemical analyses for the EOY, 2003 Sampling Event
Two Shallow Bedrock Wells are not sampled: MW-D3 (lost) and MW-D5 (dropped).

(1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)

(2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)

(3) Total Organic Carbon (/ Halogens)

(4) Parameter not reported

(5) Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event

(6) Well is not sampled during the MY, 2003 Sampling Event

(7) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

GROUNDWATER CHEMISTRY DATA

SHALLOW BEDROCK WELLS

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC</u> <u>NUA</u> ⁽⁷⁾	<u>PZ-D7</u> ⁽⁶⁾	<u>MW-D8</u>	<u>MW-D9A</u>	<u>MW-D15</u>
T P H ⁽¹⁾	mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO 13 (<1.0) GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO 2.2 (<1.0) GRO < 1.0
PCB Total-TCL ⁽²⁾	ug / l	4.3	2.4 ⁽⁶⁾	65000 (850) ⁽⁵⁾	<1.0	2.7 (6.9)
TOC ⁽³⁾	mg / l	Not Regulated	7.7 ⁽⁶⁾	7 (13)	8.6 (8.1)	13 (11)
Volatile Organics:						
Acetone	ug / l	100,000	<10	<10	<10	16 (<10)
Benzene	ug / l	500	<5.0	15 (<5.0)	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	<5.0	14 (<5.0)	16 (<5.0)
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	170 (<5.0)	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	1100 (310)	<5.0	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	11 (<5.0)	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	130 (<5.0)	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	120 (<5.0)	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	110 (24)	<5.0	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0

Notes:

Eleven Shallow Bedrock Wells (of a total of 13) are sampled for chemical analyses for the EOY, 2003 Sampling Event
Two Shallow Bedrock Wells are not sampled: MW-D3 (lost) and MW-D5 (dropped).

(1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)

(2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)

(3) Total Organic Carbon (/ Halogens)

(4) Parameter not reported

(5) Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event

(6) Well is not sampled during the MY, 2003 Sampling Event

(7) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

GROUNDWATER CHEMISTRY DATA

SHALLOW BEDROCK WELLS

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC NUA</u> ⁽⁷⁾	<u>MW-D16</u>	<u>PZ-D18</u> ⁽⁶⁾	<u>PZ-D19</u> ⁽⁶⁾
TPH ⁽¹⁾	mg / l	Not Regulated	DRO 2.7 (1.5) GRO < 1.0	DRO 2.4 ⁽⁶⁾ GRO 1.7 ⁽⁶⁾	DRO < 1.0 ⁽⁶⁾ GRO < 1.0 ⁽⁶⁾
PCB Total-TCL ⁽²⁾	ug / l	4.3	390 (850) ⁽⁵⁾	75 ⁽⁶⁾	(4)
TOC ⁽³⁾	mg / l	Not Regulated	11 (5.8)	6.9 ⁽⁶⁾	< 1.0
Volatile Organics:					
Acetone	ug / l	100,000	18 (<10)	< 5.0	< 5.0
Benzene	ug / l	500	< 5.0	82 ⁽⁶⁾	8.1 ⁽⁶⁾
Bromodichloromethane	ug / l	100	< 5.0	< 5.0	< 5.0
Bromoform	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
Bromomethane	ug / l	1,000	< 5.0	< 5.0	< 5.0
2-Butanone	ug / l	Not Regulated	< 10	< 10	< 10
Carbon Disulfide	ug / l	4,100	24 (<5)	< 5.0	< 5.0
Carbon Tetrachloride	ug / l	50	< 5.0	< 5.0	< 5.0
Chlorobenzene	ug / l	10,000	26 (22)	580 ⁽⁶⁾	55 ⁽⁶⁾
Chloroethane	ug / l	90,000	< 5.0	< 5.0	< 5.0
Chloroform	ug / l	1,000	< 5.0	< 5.0	< 5.0
Chloromethane	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
Dibromochloromethane	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	ug / l	1,100	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	ug / l	50	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	ug / l	700	300 (380)	410 ⁽⁶⁾	150 ⁽⁶⁾
trans-1,2-Dichloroethene	ug / l	1,000	6.4 (8.8)	< 5.0	< 5.0
1,2-Dichloropropane	ug / l	50	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
Ethylbenzene	ug / l	70,000	< 5.0	< 5.0	< 5.0
2-Hexanone	ug / l	Not Regulated	< 10	< 10	< 10
4-Methyl-2-pentanone	ug / l	Not Regulated	< 10	< 10	< 10
Methylene chloride	ug / l	Not Regulated	< 5.0	< 5.0	< 5.0
Propionitrile	ug / l	Not Regulated	< 100	< 100	< 100
Styrene	ug / l	10,000	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	ug / l	30	< 5.0	< 5.0	< 5.0
Tetrachloroethene	ug / l	50	< 5.0	160 ⁽⁶⁾	< 5.0
Toluene	ug / l	100,000	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	ug / l	2,000	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	ug / l	50	< 5.0	< 5.0	< 5.0
Trichloroethene	ug / l	50	< 5.0	87 ⁽⁶⁾	< 5.0
Vinyl chloride	ug / l	20	220 (180)	51 ⁽⁶⁾	33 ⁽⁶⁾
m,p-Xylene	ug / l	180,000	< 5.0	< 5.0	< 5.0
o-Xylene	ug / l	180,000	< 5.0	< 5.0	< 5.0

Notes:

Eleven Shallow Bedrock Wells (of a total of 13) are sampled for chemical analyses for the EOY, 2003 Sampling Event. Two Shallow Bedrock Wells are not sampled: MW-D3 (lost) and MW-D5 (dropped)

(1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)

(2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)

(3) Total Organic Carbon (/ Halogens)

(4) Parameter not reported

(5) Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event

(6) Well is not sampled during the MY, 2003 Sampling Event

(7) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

TABLE 6

page 1 of 1

GROUNDWATER CHEMISTRY DATA

DEEP BEDROCK WELLS

Parameter Tested	Units	PA MSC NUA ⁽⁶⁾	MW-9	MW-11 a ⁽⁴⁾	MW-11 b ⁽⁴⁾	MW-12	PZ-D14
T P H ⁽¹⁾	mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	<1.0	1.1 (< 1.0)	2.0 (< 1.0)	<1.0
TOC ⁽³⁾	mg / l	Not Regulated	3.3 (3.0) ⁽⁵⁾	2.6 (2.1)	2.1 (1.9)	3.8 (2.1)	17 (2.1)
Volatile Organics:							
Acetone	ug / l	100,000	<10	<10	<10	<10	<10
Benzene	ug / l	500	<5.0	<5.0	<5.0	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	33 (<5.0)	26 (<5.0)	7.7 (<5.0)	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	<5.0	<5.0	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:

Four Deep Bedrock Wells (of a total of 4) are sampled for chemical analyses for the **EOY, 2003** Sampling Event.

⁽¹⁾ **Total Petroleum Hydrocarbons** (**DRO** and / or **GRO**-see *Results of Analyses* for specific parameter)

⁽²⁾ **Polychlorinated Biphenyls** (**Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260** -see *Results of Analyses* for specific parameter)

⁽³⁾ **Total Organic Carbon** (/ **Halogens**)

⁽⁴⁾ **Two** samples from well **MW-11** were collected for *quality control / quality assurance purposes*.

⁽⁵⁾ Value in *parentheses* represents **analytical results** for the parameter from the **MY, 2003** Sampling Event.

⁽⁶⁾ Pennsylvania Groundwater **Medium Specific Concentration: Non Use Aquifer / Non Residential**

TABLE 7

GROUNDWATER CHEMISTRY DATA

CHARTIERS CREEK - STREAM SAMPLES

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC NUA ⁽⁶⁾</u>	<u>DOWN STREAM Sample 1</u>	<u>UP STREAM Sample 1</u>	<u>UP STREAM Sample 2</u>
T P H ⁽¹⁾	mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	<1.0	<1.0
TOC ⁽³⁾	mg / l	Not Regulated	2.7 (4.6) ⁽⁵⁾	2.6 (4.9)	2.4 (4.3)
Volatile Organics:					
Acetone	ug / l	100,000	<10	<10	<10
Benzene	ug / l	500	<5.0	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	<10	<10
Carbon Disulfide	ug / l	4,100	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0

Notes:

- Three Surface Water Samples are collected from Chartiers Creek for chemical analyses for the EOY, 2003 Sampling Event.
- (1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)
- (2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)
- (3) Total Organic Carbon (/ Halogens)
- (4) Parameter not reported (if applicable)
- (5) Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event
- (6) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

TABLE 8

GROUNDWATER CHEMISTRY DATA

TREATMENT SYSTEM INFLUENT AND CARBON FILTRATION SYSTEM

<u>Parameter Tested</u>	<u>Units</u>	<u>PA MSC NUA ⁽⁶⁾</u>	<u>BEFORE TREATMENT SYSTEM</u>	<u>BETWEEN PC1 AND PC2</u>	<u>MIDPOINT OF TREATMENT SYSTEM</u>	<u>BETWEEN PC3 AND F</u>
TPH ⁽¹⁾	mg / l	Not Regulated	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0	DRO < 1.0 GRO < 1.0
PCB Total-TCL ⁽²⁾	ug / l	4.3	<1.0	<1.0	<1.0 (3.4)	<1.0 ⁽⁴⁾
TOC ⁽³⁾	mg / l	Not Regulated	4.2 (12) ⁽⁵⁾	1.0 (11)	<1.0	1.1 ⁽⁴⁾
Volatile Organics:						
Acetone	ug / l	100,000	34 (< 10)	<10	<10	<10
Benzene	ug / l	500	<5.0	<5.0	<5.0	<5.0
Bromodichloromethane	ug / l	100	<5.0	<5.0	<5.0	<5.0
Bromoform	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
2-Butanone	ug / l	Not Regulated	<10	25 (< 10)	<10	29 ⁽⁴⁾
Carbon Disulfide	ug / l	4,100	<5.0	<5.0	<5.0	8.0 ⁽⁴⁾
Carbon Tetrachloride	ug / l	50	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug / l	90,000	<5.0	<5.0	<5.0	<5.0
Chloroform	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug / l	1,100	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug / l	700	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug / l	1,000	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug / l	50	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug / l	70,000	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug / l	Not Regulated	<10	<10	<10	<10
4-Methyl-2-pentanone	ug / l	Not Regulated	<10	<10	<10	<10
Methylene chloride	ug / l	Not Regulated	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug / l	Not Regulated	<100	<100	<100	<100
Styrene	ug / l	10,000	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug / l	30	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0
Toluene	ug / l	100,000	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	ug / l	2,000	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug / l	50	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug / l	50	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug / l	20	<5.0	<5.0	<5.0	<5.0
m,p-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0
o-Xylene	ug / l	180,000	<5.0	<5.0	<5.0	<5.0

Notes:

Four Water Samples are collected from the Treatment System Influent and Carbon Filtration System for chemical analyses for the EOY, 2003 Sampling Event.

- (1) Total Petroleum Hydrocarbons (DRO and / or GRO-see Results of Analyses for specific parameter)
- (2) Polychlorinated Biphenyls (Aroclor-1016, 1221, 1232, 1242, 1248, 1254, and / or 1260 -see Results of Analyses for specific parameter)
- (3) Total Organic Carbon (/ Halogens)
- (4) Parameter not reported (if applicable)
- (5) Value in parentheses represents analytical results for the parameter from the MY, 2003 Sampling Event
- (6) Pennsylvania Groundwater Medium Specific Concentration: Non Use Aquifer / Non Residential

FIGURES

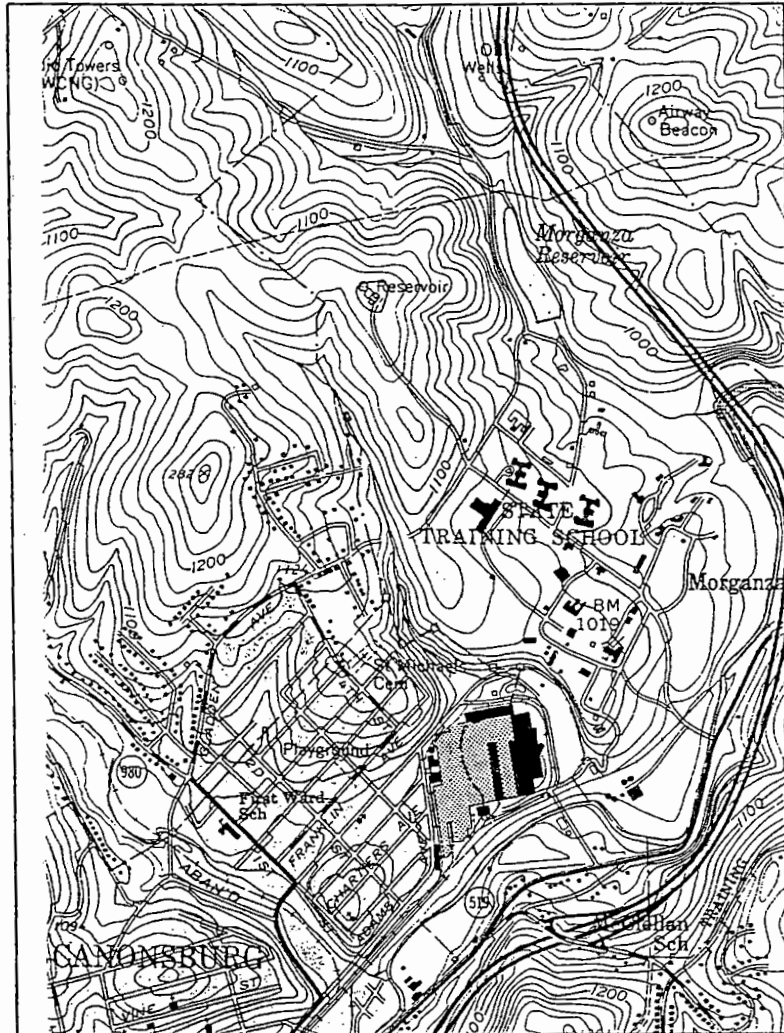
PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

LIST OF FIGURES

- FIGURE 1** Site Location Map (DWG: *MP00300*)
- FIGURE 2** Site Plan (DWG: *MP00301*)
- FIGURE 3** Groundwater Contour Map, Overburden Wells (DWG: *MP00303*)
- FIGURE 4** Groundwater Contour Map, Shallow Bedrock Wells (DWG: *MP00304*)
- FIGURE 5** Hydrocarbon Isopach Map, Overburden Wells (DWG: *MP00305*)
- FIGURE 6** Groundwater Chemistry Map (DWG: *MP00306*)

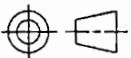



SCALE - FEET
0 2000

REFERENCE

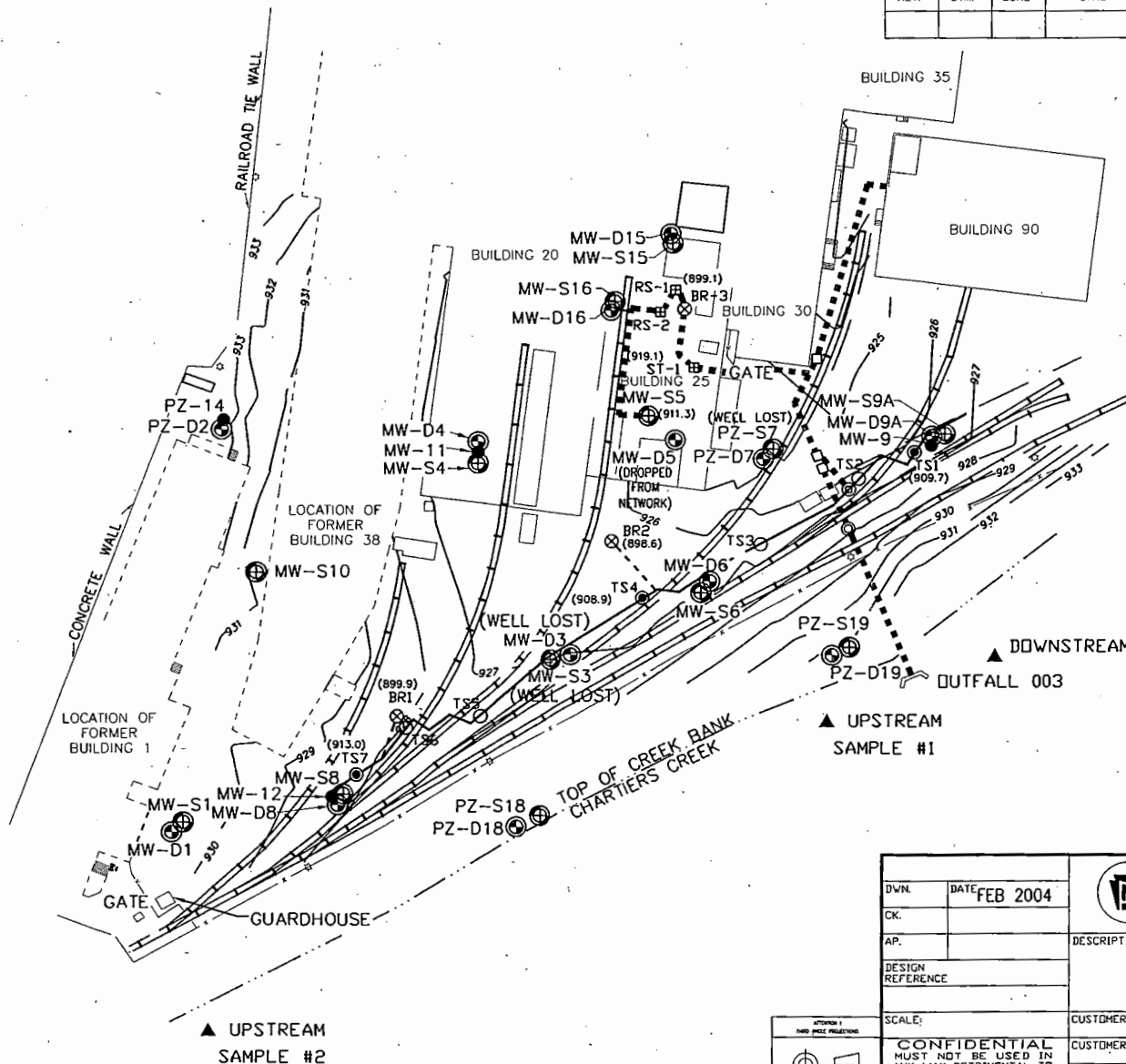
USGS 7.5-MIN. TOPOGRAPHIC QUADRANGLE,
CANONSBURG, PA, DATED 1960, SCALE
1:24,000, PHOTOREVISED 1979.

ATTENTION:
THIRD ANGLE PROJECTIONS



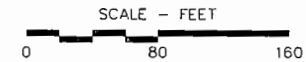
DWN. DATE		 Pennsylvania Transformer Technology, Inc. CANONSBURG, PA. 15317	SPEC.		
CK.			ORDER		
AP.			TYPE		
DESIGN REFERENCE					
SCALE:		DESCRIPTION	Figure 1 2003 YEAR-END REPORT SITE LOCATION MAP		
CUSTOMER		DEPT.			
CUSTOMER'S ORDER		CAD CODE			
CONFIDENTIAL MUST NOT BE USED IN ANY WAY DETRIMENTAL TO Pennsylvania Transformer Technology, Inc.		DRAWING		REV.	
		MP00300			

REV.	SIM.	ZONE	DATE	BY	CK.	AP.	DESCRIPTION
------	------	------	------	----	-----	-----	-------------



LEGEND

- MW-S1 GROUNDWATER MONITORING WELL SCREENED IN OVERBURDEN
- MW-D1 GROUNDWATER MONITORING WELL SCREENED IN SHALLOW BEDROCK
- MW-12 GROUNDWATER MONITORING WELL SCREENED IN DEEP BEDROCK
- INTERCEPTOR TRENCH
- BEDROCK RECOVERY WELL
- INTERCEPTOR TRENCH MONITORING SUMP
- INTERCEPTOR TRENCH RECOVERY SUMP
- RECOVERY SYSTEM UTILITY MANHOLE
- STEAM TUNNEL AND BUILDING 25 RECOVERY SUMP LOCATION
- RECOVERY SUMP OR WELL INTAKE ELEVATION (FT MSL)
- RECOVERY SYSTEM INFLUENT/EFFLUENT LINE
- STREAM SAMPLE LOCATIONS

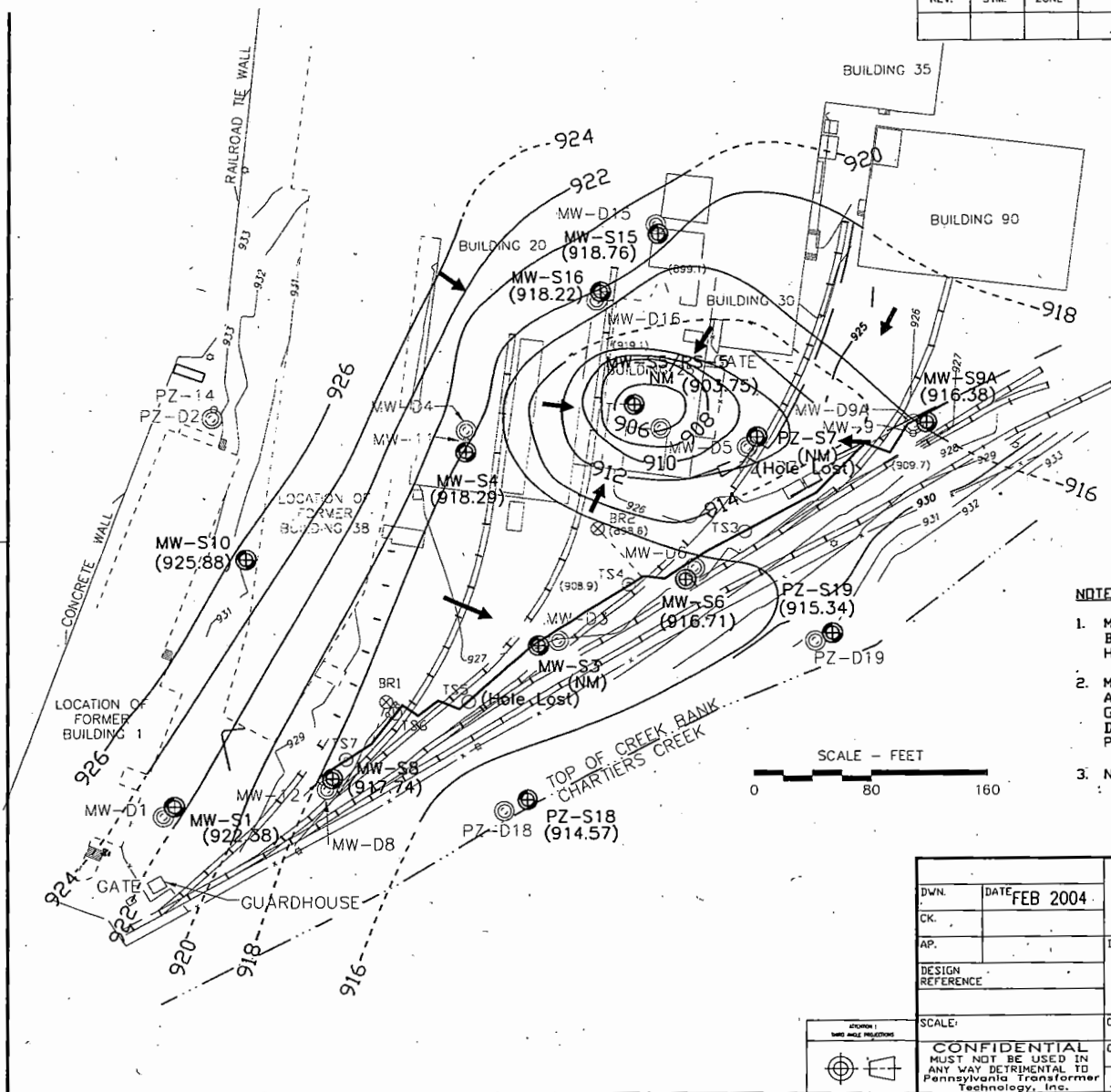


NOTES

1. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY ELLIOT SURVEYING, INC. (JULY 1988) AND BRUNDT-HARTMANN, INC. (OCT., NOV., AND DEC. 1989 AND MAY 1992).
2. MONITORING WELLS MW-D2, MW-S7, MW-D7, AND MW-14 ARE NOT COMPLIANCE POINTS, BUT ARE BEING UTILIZED AS GROUNDWATER MEASUREMENT POINTS TO AID IN THE DELINEATION OF GROUNDWATER FLOW, AS WELL AS SAMPLE POINTS DURING YEAR END EVENT.
3. YEAR END MONITORING /SAMPLING EVENT CONDUCTED BETWEEN DECEMBER 13 and DECEMBER 22, 2003.

DWG. DATE FEB 2004			Pennsylvania Transformer Technology, Inc.		SPEC.
CK.			CANONSBURG, PA. 15317		ORDER
AP.		DESCRIPTION		TYPE	
DESIGN REFERENCE		Figure 2		DEPT.	
SCALE:		CUSTOMER		CAB CODE	
CONFIDENTIAL MUST NOT BE USED IN ANY WAY DETRIMENTAL TO Pennsylvania Transformer Technology, Inc.		CUSTOMER'S ORDER		DRAWING MP00301	
				REV.	

REV.	SIM.	DATE	BY	CK.	AP.	DESCRIPTION



LEGEND

- MW-S1 GROUNDWATER MONITORING WELL SCREENED IN OVERBURDEN
- MW-D1 GROUNDWATER MONITORING WELL SCREENED IN SHALLOW BEDROCK
- MW-12 GROUNDWATER MONITORING WELL SCREENED IN DEEP BEDROCK
- INTERCEPTOR TRENCH
- BEDROCK RECOVERY WELL
- INTERCEPTOR TRENCH MONITORING SUMP
- INTERCEPTOR TRENCH RECOVERY SUMP
- RECOVERY SYSTEM UTILITY MANHOLE
- STEAM TUNNEL AND BUILDING 25 RECOVERY SUMP LOCATION
- (909.7) RECOVERY SUMP OR WELL INTAKE ELEVATION (FT MSL)
- RECOVERY SYSTEM INFLUENT/EFFLUENT LINE
- IMPLIED GROUNDWATER FLOW DIRECTION
- (917.74) GROUNDWATER ELEVATION, FEET MSL MEASURED 12/(15, 17, 18, & 22)/2003
- 920 --- GROUNDWATER CONTOUR (DASHED WHERE INFERRED) (CONTOUR INTERVAL: 2.0')

NOTES

- MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY ELLIOT SURVEYING, INC. (JULY 1988) AND BRUNDT-HARTMANN INC. (OCT., NOV., AND DEC. 1989 AND MAY 1992).
- MONITORING WELLS PZ-D2, PZ-S7, PZ-D7, AND PZ-14 ARE NOT COMPLIANCE POINTS, BUT ARE BEING UTILIZED AS GROUNDWATER MEASUREMENT POINTS TO AID IN THE DELINEATION OF GROUNDWATER FLOW AS WELL AS SAMPLE POINTS DURING THE YEAR END EVENT.
- NM=NOT MEASURED; WELL LOST

SCALE - FEET

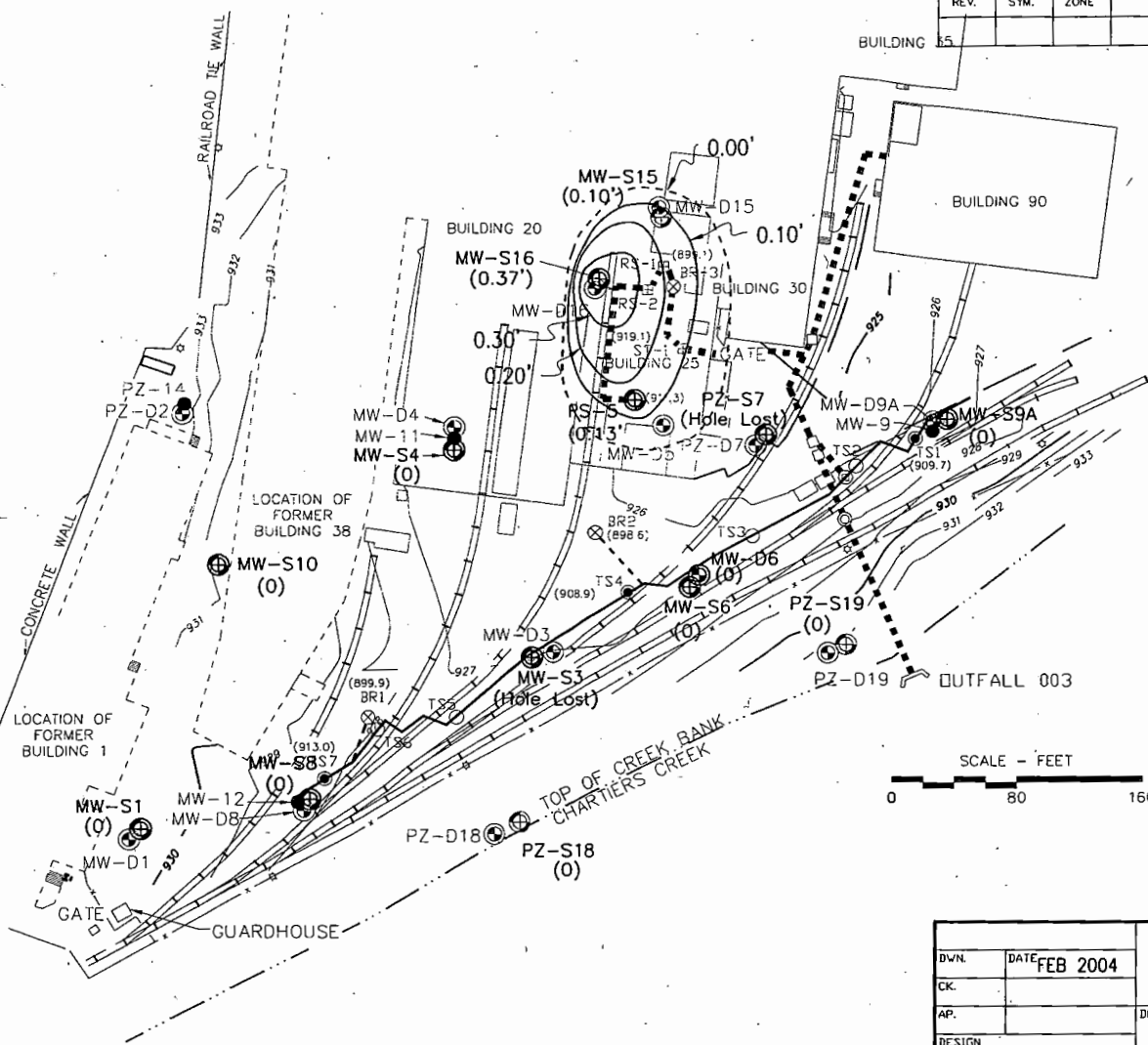
0 80 160

DWN. DATE FEB 2004			Pennsylvania Transformer Technology, Inc.		SPEC.
CK.			CANONSBURG, PA. 15317		ORDER
AP.		DESCRIPTION		TYPE	
DESIGN REFERENCE		Figure 3			
SCALE		2003 YEAR END REPORT BLDG 20/25 AREA GROUNDWATER CONTOUR MAP OVERBURDEN WELLS		DEPT.	
CUSTOMER		CUSTOMER'S ORDER		CAD CODE	
CONFIDENTIAL MUST NOT BE USED IN ANY WAY DETRIMENTAL TO Pennsylvania Transformer Technology, Inc.		DRAWING		REV.	
		MP00303			

DESCRIPTION

1

A



LEGEND

- MW-S1 GROUNDWATER MONITORING WELL SCREENED IN OVERBURDEN
- MW-D1 GROUNDWATER MONITORING WELL SCREENED IN SHALLOW BEDROCK
- MW-12 GROUNDWATER MONITORING WELL SCREENED IN DEEP BEDROCK
- (0.10') LIQUID HYDROCARBON THICKNESS (FEET) MEASURED 12/15, 17, 18 & 22/2003
- 0.00'--- APPROXIMATE MAXIMUM EXTENT OF LNAPl PLUME (FEET) (CONTOUR INTERVAL : 0.10'/DASHED WHERE INFERRED)
- 0.10'— LNAPl ISOPACH IN OVERBURDEN ZONE (FEET)
- INTERCEPTOR TRENCH
- BEDROCK RECOVERY WELL
- INTERCEPTOR TRENCH MONITORING SUMP
- INTERCEPTOR TRENCH RECOVERY SUMP
- RECOVERY SYSTEM UTILITY MANHOLE
- STEAM TUNNEL AND BUILDING 25 RECOVERY SUMP LOCATION
- (909.7) RECOVERY SUMP OR WELL INTAKE ELEVATION (FT MSL)
- RECOVERY SYSTEM INFLUENT/EFFLUENT LINE

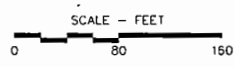
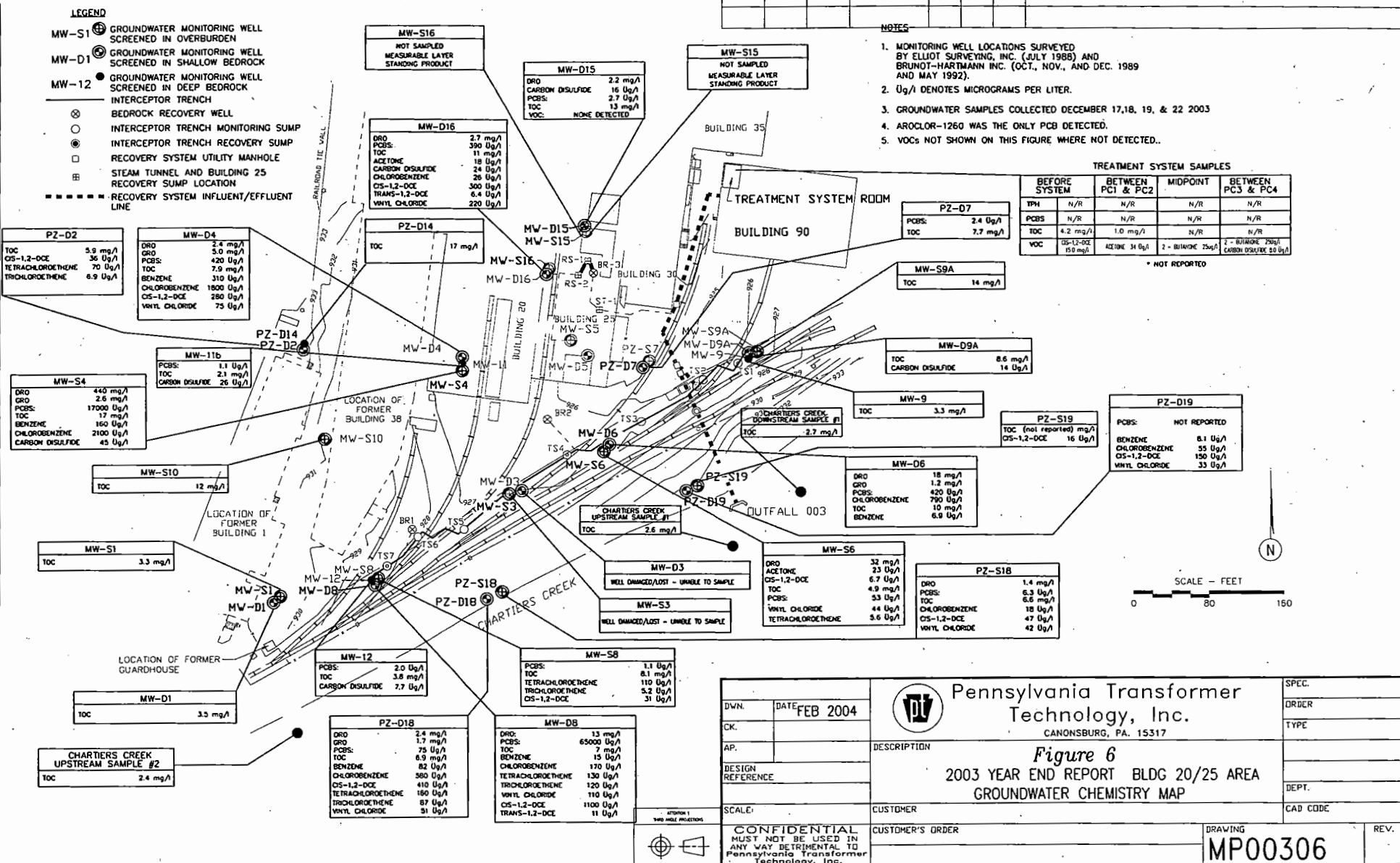
NOTES

1. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY ELLIOT SURVEYING, INC. (JULY 1988) AND BRUNDT-HARTMANN INC. (OCT., NOV., AND DEC. 1989 AND MAY 1992).
2. HYDROCARBON RECOVERY SYSTEM STARTED AUGUST 17, 1992 ON PILOT BASIS, AND ON DECEMBER 15, 1992 IN NORMAL OPERATION. SYSTEM SHUT DOWN FOR REPAIRS AND MODIFICATIONS PERIODICALLY SINCE NOVEMBER 1993.
3. NM = NOT MEASURED; WELL LOST

DWN. DATE FEB 2004 CK. AP. DESIGN REFERENCE		 Pennsylvania Transformer Technology, Inc. CANONSBURG, PA. 15317		SPEC. ORDER TYPE
SCALE:		DESCRIPTION Figure 5 2003 YEAR END REPORT BLDG 20/25 AREA HYDROCARBON THICKNESS MAP		DEPT. CAD CODE
CUSTOMER'S ORDER		DRAWING MP00305		REV.

NOTES

1. MONITORING WELL LOCATIONS SURVEYED BY ELLIOT SURVEYING, INC. (JULY 1988) AND BRUNOT-HARTMANN INC. (OCT., NOV., AND DEC. 1989 AND MAY 1992).
2. UG/L DENOTES MICROGRAMS PER LITER.
3. GROUNDWATER SAMPLES COLLECTED DECEMBER 17, 18, 19, & 22 2003
4. AROCLOR-1260 WAS THE ONLY PCB DETECTED.
5. VOCs NOT SHOWN ON THIS FIGURE WHERE NOT DETECTED..



DWN.	DATE FEB 2004	<p>Pennsylvania Transformer Technology, Inc. CANONSBURG, PA. 15317</p>	SPEC.
CK.			ORDER
AP.			TYPE
DESIGN REFERENCE			
DESCRIPTION	<p>Figure 6 2003 YEAR END REPORT BLDG 20/25 AREA GROUNDWATER CHEMISTRY MAP</p>		DEPT.
CUSTOMER	CUSTOMER'S ORDER		CAD CODE
SCALE	<p>CONFIDENTIAL MUST NOT BE USED IN ANY WAY DETRIMENTAL TO Pennsylvania Transformer Technology, Inc.</p>		DRAWING
			REV.

MP00306

APPENDIX A

OBSERVATION WELL FIELD DATA

INCLUDES INFORMATION ABOUT WELLS THAT HAVE BEEN "LOST" / "DESTROYED"
OR ARE NO LONGER PART OF THE MONITORING PROGRAM

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OVERBURDEN WELLS:

- 1- MW-S1
- 2- MW-S3
- 3- MW-S4
- 4- MW-S5 / RS-5 (Recovery Sump)
- 5- MW-S6
- 6- PZ-S7
- 7- MW-S8
- 8- MW-S9A
- 9- MW-S10
- 10- MW-S15
- 11- MW-S16
- 12- PZ-S18
- 13- PZ-S19

SHALLOW BEDROCK WELLS:

- 14- MW-D1
- 15- PZ-D2
- 16- MW-D3
- 17- MW-D4
- 18- MW-D5
- 19- MW-D6
- 20- PZ-D7
- 21- MW-D8
- 22- MW-D9A
- 23- MW-D15
- 24- MW-D16
- 25- PZ-D18
- 26- PZ-D19

DEEP BEDROCK WELLS:

- 27- MW-9
- 28- MW-11
- 29- MW-12
- 30- PZ-D14

APPENDIX A

OBSERVATION WELL FIELD DATA

**INCLUDES INFORMATION ABOUT WELLS THAT HAVE BEEN "LOST" / "DESTROYED"
OR ARE NO LONGER PART OF THE MONITORING PROGRAM**

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OVERBURDEN WELLS:

- 1- MW-S1*
- 2- MW-S3*
- 3- MW-S4*
- 4- MW-S5 / RS-5 (Recovery Sump)*
- 5- MW-S6*
- 6- PZ-S7*
- 7- MW-S8*
- 8- MW-S9A*
- 9- MW-S10*
- 10- MW-S15*
- 11- MW-S16*
- 12- PZ-S18*
- 13- PZ-S19*

MW-S1

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-S1

Type Of Well: **Overburden Well**

Stick-Up (TOC) From Ground Surface: **12 / 04 / 01: Top of PVC casing is at Ground Surface**

Historical (07 / 07 / 03) Water Level From TOC: **7.52'**

Total Depth Of Well From Stick-Up (TOC): **13.32'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good-No anomalies-"Sometimes difficult to access"-Rieger Crane Parking Area

WATER LEVEL DATA

Day / Date: FRI, 12 / 19 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

Time: 11:40 AM / PM

(I) Water Level: 07 / 07 / 03 - 7.52'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: FRI, 12 / 19 / 03

Time: 12:15 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(13.32') - (7.52') = \mathbf{(5.80')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(5.80')} = \mathbf{0.98\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 08 / 03 $(3) \times (0.85\text{-gal}) = 2.55\text{-gal}$
12 / 19 / 03 $(3) \times (0.98\text{-gal}) = 2.94\text{-gal}$

Actual Volume (gal) Removed : hist- 07 / 08 / 03: 5.0-gal 12 / 19 / 03: 3.5-gal

Bailed To Dryness : Yes: _____ No: X Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 12:20 AM / PM

Time Bailing Ended: 12:30 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 12:20 pm *</u>	<u>1.0-gal</u>	<u>7.35</u>	<u>0.355</u>	<u>450 m</u>	<u>8.22</u>	<u>15.1</u>	<u>0.02</u>	<u>45</u>
<u>2- 12:25 pm *</u>	<u>1.5-gal</u>	<u>7.45</u>	<u>0.485</u>	<u>500 m</u>	<u>7.89</u>	<u>15.1</u>	<u>0.02</u>	<u>40</u>
<u>3- 12:30 pm *</u>	<u>1.0-gal</u>	<u>7.45</u>	<u>0.395</u>	<u>750 m-h</u>	<u>8.95</u>	<u>15.1</u>	<u>0.02</u>	<u>65</u>
<u>12 / 19 / 03</u>	<u>3.5-gal</u>		<u>(ms/cm)</u>	<u>l-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: None

Immiscible Layers: Yes _____ No X LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Drk Gry, Med Turbidity, 2- Med Brn-Gry, Med Turbidity,

3- Med-Drk Gry, Med-High Turbidity / Turbidity increased with depth / bailing

Water Samples-For Chemical Analyses-Date / Time: FRI: 12 / 19 / 03 - 12:30 AM / PM

MW-S3

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

This well has been permanently "**destroyed / lost**" and can no longer be utilized as a monitoring / sampling site

OBSERVATION WELL FIELD DATA
BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : MW-S3 - WELL HAS BEEN " LOST "

**THIS WELL CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT -
WELL HAS BEEN "LOST / DAMAGED BEYOND REPAIR".**

**THEREFORE, WELL # MW-S3 IS NOT PART OF THE END OF YEAR MONITORING /
SAMPLING EVENT - DECEMBER, 2003.**

Type Of Well: Overburden Well

Stick-Up (roc) From Ground Surface: 12/4/01: Top of PVC casing is at Ground Surface

Historical (04/00) Water Level From TOC: 10.89' in Apr, 2000 Well can no longer be gauged

Total Depth Of Well From Stick-Up (roc): 15.20'

Diameter Of Well: d = 2-in = 0.17'

Radius Of Well: r = (0.17') x (0.5') = 0.085'

Well Condition: This well "has been lost"- this well is "damaged". Somehow, this well has
been "filled with sand / soil". The well can no longer be used a monitoring / sampling site.
This well was last gauged in the June, 2000 event.

WATER LEVEL DATA

WELL # MW-S3 CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT.

Day / Date: N / A

(1) LNAPL: hist 6 / 12 / 00 - None 07 / 03 - N / A

Time: N / A

(1) Water Level: 07 / 03 - N / A

Field Tech: N / A

(1) DNAPL: 07 / 03 - N / A

(1) Measured from Top Of Casing

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Other Notes: N / A

BAILING / EVACUATION DATA

WELL # MW-S3 CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT.

Day / Date: N / A

Time: N / A Field Tech: N / A

Gallons Per Foot = (3.1416 x r² x 7.48): N / A

Thickness / Height (ft) Of Water Column = (TD - WL): N / A

Volume (gal) In Water Column = (GPF x TWC): N / A

Theoretical Volume (gal) To Be Removed = (VIWC x 3): N / A

Actual Volume (gal) Removed : N / A

Bailed To Dryness : Yes: _____ No: _____ Notes: N / A

Evacuation Method - Bailing: N / A

Pump: N / A

If Bailing: Time Bailing Began: N / A

Time Bailing Ended: N / A

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCT- IVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Immiscible Layers: Yes _____ No _____ LNAPL N / A DNAPL N / A Desc / Color / Comments N / A

MW-S4

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA**BUILDING 20 / 25 MONITORING NETWORK****SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003****WELL I.D. # :****MW-S4**Type Of Well: **Overburden Well**Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**Historical (07/07/03) Water Level From TOC: **8.28'**Total Depth Of Well From Stick-Up (roc): **15.40'**Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$ Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$ Well Condition: **Well is Located "Inside" Building # 20-Good Condition / No Anomalies****WATER LEVEL DATA**Day / Date: MON, 12 / 15 / 03(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - NoneTime: 2:40 AM / PM(I) Water Level: 07 / 07 / 03 - 7.98'Field Tech: DGP(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☒ Moderate ☐ Strong Type Of Odor: ProductOther Notes: Slight product odor (oil) during well gauging activity.**BAILING / EVACUATION DATA**Day / Date: WED, 12 / 17 / 03Time: 11:05 AM / PMField Tech: DGPGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$ Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(15.40') - (7.98') = \mathbf{(7.42')}$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(7.42')} = \mathbf{1.26\text{-gal}}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 (3) x (1.21-gal) = 3.63-gal
12 / 17 / 03 (3) x (1.26-gal) = 3.78-galActual Volume (gal) Removed : hist- 07 / 09 / 03: 3.5-gal 12 / 17 / 03: 3.5-galBailed To Dryness: Yes: ☐ No: ☒ Notes: Sheen and Slight Product Odor During Bailing**Evacuation Method - Bailing:** BailingPump: N / A**If Bailing:** Time Bailing Began: 11:10 AM / PMTime Bailing Ended: 11:15 AM / PM**If Pumping:** Time Pumping Began: N / ATime Pumping Ended: N / A**Stabilization Information - Measured For Each Well Volume Excavated**

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
I- 11:15 am *	3.5-gal	7.10	0.898	590 m-h	2.71	15.4	0.04	70
12 / 16 / 03	<u>3.5-gal</u>		(ms/cm)	<i>I-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☐ Weak ☐ Moderate ☒ Strong ☒Type Of Odor: Moderate to Strong Product Odor and Sheen During BailingImmiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None* Desc / Color / Comments I- Med-Drk Gry, Med-High Turbidity with moderate to strong product odor and sheen during well gauging and bailing**Water Samples-For Chemical Analyses-Date / Time:** WED: 07 / 17 / 03 - 11:20 AM / PM

MW-S5 / RS-5 (recovery sump)

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

Note:

Well # **MW-S5 / RS-5** is **not** part of the bailing and sampling program for
either the mid year or end of year monitoring event.

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : MW-S5 / RS-5 (Recovery Sump) - "MEASURABLE PRODUCT" IN WELL

**THIS WELL IS NOT USED AS A SAMPLING POINT - PRODUCT RECOVERY SYSTEM IS OPERATIONAL.
HOWEVER, THE WATER LEVEL IN WELL # MW-S5 / RS-5 CAN BE GAUGED AS PART OF THE END OF YEAR
MONITORING / SAMPLING EVENT - DECEMBER, 2003.**

Type Of Well: **Overburden Well**

Stick-Up (toc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **7.31'**

Total Depth Of Well From Stick-Up (toc): **9.50'**

Diameter Of Well: $d = 6\text{-in} = 0.50'$

Radius Of Well: $r = (0.50') \times (0.5') = 0.25'$

Well Condition: **Recovery Well / Sump is Located "Inside" Building # 25**

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(t) LNAPL: 07 / 07 / 03 - 0.11' 12 / 15 / 03 - 0.13'

Time: 2:00 AM / PM

(t) Water Level: 12 / 15 / 03 - 7.55'

Field Tech: DGP

(t) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(t) Measured from Top Of Casing

Discernable Odor During Event: None Weak Moderate Strong **X** Type Of Odor: **Product-Oil**

Other Notes: **Measurable product in well column: depth top of product-7.42' / depth
bottom of product-7.55' (0.13')**

**THIS WELL IS NOT USED AS A SAMPLING POINT:
PRODUCT RECOVERY SYSTEM IS OPERATIONAL IN THIS RECOVERY WELL.
CONSEQUENTLY, WELL # MW-S5 / RS-5 IS NOT SAMPLED AS PART OF THE
END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003.**

BAILING / EVACUATION DATA

Day / Date: N / A

Time: N / A Field Tech: N / A

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: N / A

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(9.50') - (7.55') = (1.95')$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times (1.95') = 0.33\text{-gal}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: N / A

Actual Volume (gal) Removed: N / A

Bailed To Dryness: Yes: _____ No: _____ Notes: N / A

Evacuation Method - Bailing: N / A

Pump: N / A

If Bailing: Time Bailing Began: N / A

Time Bailing Ended: N / A

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCT- IVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Immiscible Layers: Yes: _____ No: _____ LNAPL N / A DNAPL N / A Desc / Color / Comments N / A

MW-S6

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-S6

Type Of Well: **Overburden Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **10.37'**

Total Depth Of Well From Stick-Up (roc): **13.15'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **FRI, 12 / 19 / 03**

(n) LNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

Time: **12:45 AM / PM**

(n) Water Level: 12 / 19 / 03 - 9.75'

Field Tech: **DGP**

(n) DNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None **X** Weak Moderate Strong Type Of Odor: **No Odor**

Other Notes: **N / A**

BAILING / EVACUATION DATA

Day / Date: **FRI, 12 / 19 / 03** Time: **1:00 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(13.32') - (9.75') = \mathbf{(3.57')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(3.57')} = \mathbf{0.61\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 (3) x (0.50-gal) = 1.50-gal
12 / 19 / 03 (3) x (0.61-gal) = 1.82-gal

Actual Volume (gal) Removed : hist- 07 / 09 / 03: 2.0-gal 12 / 19 / 03: 2.0-gal

Bailed To Dryness: Yes: No: **X** Notes: **Slight Sheen and Weak Product Odor During Bailing**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **1:00 AM / PM**

Time Bailing Ended: **1:05 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>I- 1:05 pm *</u>	<u>2.0-gal</u>	<u>6.85</u>	<u>0.685</u>	<u>410 m-h</u>	<u>3.82</u>	<u>14.8</u>	<u>0.01</u>	<u>- 80</u>
<u>12 / 19 / 03</u>	<u>2.0-gal</u>		(ms/cm)	<u>I-low</u> <u>m-medium</u> <u>h-high</u>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None Weak Moderate **X** Strong **X**

Type Of Odor: **Weak Product Odor and Slight Sheen during bailing**

Immiscible Layers: Yes No **X**

LNAPL: **None**

DNAPL: **None**



PZ-S7

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

This well has been permanently "**destroyed / lost**" and can no longer be utilized as a monitoring / sampling site.

OBSERVATION WELL FIELD DATA
BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : **PZ-S7 - WELL HAS BEEN " LOST "**

**THIS WELL CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT -
WELL HAS BEEN "LOST / DAMAGED BEYOND REPAIR".**

**THEREFORE, WELL # PZ-S7 IS NOT PART OF THE END OF YEAR MONITORING /
SAMPLING EVENT - DECEMBER, 2003.**

Type Of Well: **Overburden Well**

Stick-Up (roc) From Ground Surface: **12/4/01: N / A - SEE " WELL CONDITION NOTES "**

Historical (6/12/01) Water Level From TOC: **N / A - SEE " WELL CONDITION NOTES "**

Total Depth Of Well From Stick-Up (roc): **N / A - SEE " WELL CONDITION NOTES "**

Diameter Of Well: **d = 2-in = 0.17 '**

Radius Of Well: **r = (0.17 ') x (0.5 ') = 0.085 '**

Well Condition: **This well "has been lost"- due to landscaping activity in the grass area near
/ "in-front-of" Building # 25. Well can not be located. Physically searched for the well
between 2:35 PM and 2:45 PM on the afternoon of Tuesday, December 4, 2001 to no avail.**

WATER LEVEL DATA

WELL PZ-S7 CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT.

Day / Date: **N / A**

(I) LNAPL: **N / A**

Time: **N / A**

(I) Water Level: **N / A**

Field Tech: **DGP / RH / JF**

(I) DNAPL: **N / A**

(I) Measured from Top Of Casing

Discernable Odor During Event: **None** ☐ **Weak** ☐ **Moderate** ☐ **Strong** ☐ Type Of Odor: **N / A**

Other Notes: **N / A**

BAILING / EVACUATION DATA

WELL PZ-S7 CAN NO LONGER BE USED AS A SAMPLING / MONITORING POINT.

Day / Date: **N / A**

Time: **N / A**

Field Tech: **N / A**

Gallons Per Foot = (3.1416 x r² x 7.48): **N / A**

Thickness / Height (ft) Of Water Column = (TD - WL): **N / A**

Volume (gal) In Water Column = (GPF x TWC): **N / A**

Theoretical Volume (gal) To Be Removed = (VIWC x 3): **N / A**

Actual Volume (gal) Removed : **N / A**

Bailed To Dryness : **Yes:** ☐ **No:** ☐ Notes: **N / A**

Evacuation Method - Bailing: **N / A**

Pump: **N / A**

If Bailing: Time Bailing Began: **N / A**

Time Bailing Ended: **N / A**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCT- TIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A

Discernable Odor During Event: **None** ☐ **Weak** ☐ **Moderate** ☐ **Strong** ☐ Type Of Odor: **N / A**

Immiscible Layers: **Yes** ☐ **No** ☐ LNAPL **N / A** DNAPL **N / A** Desc / Color / Comments **N / A**

MW-S8

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA
BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-S8

Type Of Well: **Overburden Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **11.67'**

Total Depth Of Well From Stick-Up (roc): **15.65'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **MON, 12 / 15 / 03**

(1) LNAPL: **07 / 07 / 03 - None 12 / 15 / 03 - None**

Time: **12:50 AM / PM**

(1) Water Level: **07 / 07 / 03 - 10.32'**

Field Tech: **DGP**

(1) DNAPL: **07 / 07 / 03 - None 12 / 15 / 03 - None**

(1) Measured from Top Of Casing

Discernable Odor During Event: **None** ☒ **Weak** ☐ **Moderate** ☐ **Strong** Type Of Odor: **No Odor**

Other Notes: **N / A**

BAILING / EVACUATION DATA

Day / Date: **FRI, 12 / 19 / 03**

Time: **10:40 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(15.65') - (10.32') = \mathbf{(5.33')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(5.33')} = \mathbf{0.91\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: **07 / 08 / 03 (3) x (0.68-gal) = 2.03-gal**
12 / 19 / 03 (3) x (0.91-gal) = 2.72-gal

Actual Volume (gal) Removed : hist- **07 / 08 / 03: 3.5-gal** **12 / 19 / 03: 6.0-gal**

Bailed To Dryness: **Yes:** ☐ **No:** ☒ **Notes:** **N / A**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **10:40 AM / PM**

Time Bailing Ended: **10:55 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
1- 10:45 am *	2.0-gal	7.04	0.621	999 h	3.88	13.6	0.02	75
2- 10:50 am *	2.0-gal	7.15	0.594	999 h	3.65	14.1	0.02	85
3- 10:55 am *	2.0-gal	7.14	0.488	999 h	4.01	14.1	0.02	90
12 / 19 / 03	<u>6.0-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: **None** ☒ **Weak** ☐ **Moderate** ☐ **Strong** Type Of Odor: **None**

Immiscible Layers: **Yes** ☐ **No** ☒ **LNAPL:** **None** **DNAPL:** **None**

* Desc / Color / Comments **1- Drk Brn-Gry. High Turbidity, 2- Drk Gry-Brn. High Turbidity 3- Drk Gry High Turbidity / Turbidity "remained" high with depth-bailing**

Water Samples-For Chemical Analyses-Date / Time: **FRI: 12 / 19 / 03 - 11:00 AM / PM**

MW-S9A

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-S9A

Type Of Well: **Overburden Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **10.46'**

Total Depth Of Well From Stick-Up (TOC): **12.10'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **THU, 12/18/03**

(I) LNAPL: 07/07/03 - None 12/18/03 - None

Time: **2:30 AM/PM**

(I) Water Level: 12/18/03 - 9.82'

Field Tech: **DGP**

(I) DNAPL: 07/07/03 - None 12/18/03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: **No Odor**

Other Notes: **Sampled "immediately due to water volume in well. Did not bail."**

BAILING / EVACUATION DATA

Day / Date: **THU, 12/18/03**

Time: **2:40 AM/PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(12.10') - (9.82') = \mathbf{(2.28')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(2.28')} = \mathbf{0.39\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07/08/03 (3) x (0.28-gal) = 0.84-gal
12/18/03 (3) x (0.39-gal) = 1.16-gal

Actual Volume (gal) Removed: **Sample volume: hist-07/08/03: 1.0-gal 12/18/03: 1.5-gal**

Bailed To Dryness: Yes: ☒ No ☐ Notes: **Essentially "bailed dry" during sampling. Did not sample / bail for stabilization tests due to water volume in well, which is only about 0.4-gallons. The well did seem to "recharge" during sampling, however.**

Evacuation Method - Bailing: **For Sample Collection**

Pump: **N/A**

If Bailing: Time Bailing Began: **N/A**

Time Bailing Ended: **N/A**

If Pumping: Time Pumping Began: **N/A**

Time Pumping Ended: **N/A**

Stabilization Information - Measured For Each Well Volume Excavated

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
<i>See Notes above: Did not sample for stabilization testing due to well volume.</i>								
I-*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			(ms/cm)	I-low m-medium h-high	(mg/l)	(°C)	(%)	(mV)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐

Type Of Odor: **None**

* Desc / Color / Comments I- Lit-Med Gry, Medium Turbidity-During Sampling

Water Samples-For Chemical Analyses-Date / Time: THU: 12 / 18 / 03 - 2:50 AM / PM

MW-S10

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA**BUILDING 20 / 25 MONITORING NETWORK****SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003****WELL I.D. # :****MW-S10**Type Of Well: **Overburden Well**Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**Historical (07/07/03) Water Level From TOC: **5.96'**Total Depth Of Well From Stick-Up (roc): **8.60'**Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$ Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$ Well Condition: Well is located in middle of gravel road. Well cover and cap are damaged.**WATER LEVEL DATA**Day / Date: MON, 12 / 22 / 03(t) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - NoneTime: 11:15 AM / PM(t) Water Level: 12 / 19 / 03 - 4.48'Field Tech: DGP(t) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: No OdorOther Notes: N / A**BAILING / EVACUATION DATA**Day / Date: MON, 12 / 22 / 03Time: 11:30 AM / PMField Tech: DGPGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$ Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(13.32') - (4.48') = \mathbf{(8.84')}$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(8.84')} = \mathbf{1.50\text{-gal}}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 08 / 03 (3) x (1.25-gal) = 3.75-gal
12 / 22 / 03 (3) x (1.50-gal) = 4.51-galActual Volume (gal) Removed: hist - 07 / 08 / 03: 2.0-gal 12 / 22 / 03: 3.0-galBailed To Dryness: Yes: ☐ No: ☒ Notes: N / AEvacuation Method - Bailing: BailingPump: N / AIf Bailing: Time Bailing Began: 11:30 AM / PMTime Bailing Ended: 11:400 AM / PMIf Pumping: Time Pumping Began: N / ATime Pumping Ended: N / A**Stabilization Information - Measured For Each Well Volume Excavated**

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
I- 11:40 am*	3.0-gal	7.18	0.575	455 m	3.45	15.0	0.02	- 25
12/ 22/ 03	<u>3.0-gal</u>		(ms/cm)	<i>l</i> -low <i>m</i> -medium <i>h</i> -high	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: NoneImmiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None* Desc / Color / Comments I- Med Brn-Gry, Med TurbidityWater Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 12:00 AM / PM

MW-S15

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

Bailing and sampling of Well # **MW-S15** is **not required**
as part of **either** the mid year or end of year sampling event

This well has historically exhibited "standing product" in the well column.

OBSERVATION WELL FIELD DATA**BUILDING 20 / 25 MONITORING NETWORK****SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003****WELL I.D. # :** **MW-S15** - "MEASURABLE PRODUCT" IN WELLType Of Well: **Overburden Well**Stick-Up (roc) From Ground Surface: **12 / 04 / 01: Top of PVC casing is at Ground Surface**Historical (07 / 07 / 03) Water Level From TOC: **6.81'**Total Depth Of Well From Stick-Up (roc): **13.00'**Diameter Of Well: $d = 2\text{-in} = 0.17'$ Radius Of Well: $r = (0.17') \times (0.5') = 0.085'$ Well Condition: **Well is Located "Inside" Building # 25** - Good Condition / No Anomalies**WATER LEVEL DATA**Day / Date: **MON, 12 / 15 / 03**(I) LNAPL: **07 / 07 / 03 - 0.08'** 12 / 15 / 03 - **0.10'**Time: **1:45 AM / PM**(I) Water Level: **07 / 07 / 03 - 7.04'**Field Tech: **DGP**(I) DNAPL: **07 / 07 / 03 - None** 12 / 15 / 03 - **None**

(I) Measured from Top Of Casing

Discernable Odor During Event: **None** Weak Moderate Strong **X** Type Of Odor: **Product-Oil**Other Notes: **Measurable product in well column: depth top of product-6.94' / depth bottom of product-7.04' (0.10').****BAILING AND SAMPLING OF WELL # MW-S15 IS NOT REQUIRED FOR THE END OF YEAR, 2003 MONITORING EVENT DUE TO PRESENCE OF "STANDING PRODUCT" IN WELL.****BAILING / EVACUATION DATA**Day / Date: **N / A**Time: **N / A** Field Tech: **N / A**Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: **N / A**Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(13.00') - (7.04') = (5.96')$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal}/\text{ft}) \times (5.96') = 1.01\text{-gal}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: **N / A**Actual Volume (gal) Removed: **N / A**Bailed To Dryness: Yes: _____ No: _____ Notes: **N / A**Evacuation Method - Bailing: **N / A**Pump: **N / A**If Bailing: Time Bailing Began: **N / A**Time Bailing Ended: **N / A**If Pumping: Time Pumping Began: **N / A**Time Pumping Ended: **N / A****Stabilization Information - Measured For Each Well Volume Excavated**

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A

Discernable Odor During Event: **None** Weak Moderate Strong Type Of Odor: **N / A**Immiscible Layers: Yes: _____ No: _____ LNAPL **N / A** DNAPL **N / A** Desc / Color / Comments **N / A**

MW-S16

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

Bailing and sampling of Well # **MW-S16** is **not required**
as part of **either** the mid year or end of year sampling event

This well has historically exhibited "standing product" in the well column.

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : MW-S16 - "MEASURABLE PRODUCT" IN WELL

Type Of Well: Overburden Well

Stick-Up (roc) From Ground Surface: 12 / 04 / 01: Top of PVC casing is at Ground Surface

Historical (07 / 07 / 03) Water Level From TOC: 7.61'

Total Depth Of Well From Stick-Up (roc): 12.90'

Diameter Of Well: $d = 2\text{-in} = 0.17'$

Radius Of Well: $r = (0.17') \times (0.5') = 0.085'$

Well Condition: Well is Located "Inside" Building # 20 - Good Condition / No Anomalies

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(I) LNAPL: 07 / 07 / 03 - 0.24' 12 / 15 / 03 - 0.37'

Time: 1:35 AM / PM

(I) Water Level: 07 / 07 / 03 - 7.88'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None Weak Moderate Strong X Type Of Odor: Product-Oil

Other Notes: Measurable product in well column: depth top of product-7.51' / depth bottom of product-7.88' (0.37')

BAILING AND SAMPLING OF WELL # MW-S16 IS NOT REQUIRED FOR THE END OF YEAR, 2003 MONITORING EVENT DUE TO PRESENCE OF "STANDING PRODUCT" IN WELL.

BAILING / EVACUATION DATA

Day / Date: N / A

Time: N / A Field Tech: N / A

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: N / A

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(12.90') - (7.88') = (5.02')$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times (5.02') = 0.85\text{-gal}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: N / A

Actual Volume (gal) Removed : N / A

Bailed To Dryness : Yes: _____ No: _____ Notes: N / A

Evacuation Method - Bailing: N / A

Pump: N / A

If Bailing: Time Bailing Began: N / A

Time Bailing Ended: N / A

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Immiscible Layers: Yes: _____ No: _____ LNAPL N / A DNAPL N / A Desc / Color / Comments N / A

PZ-S18

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

PZ-S18

Type Of Well: **Overburden Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **17.07'**

Total Depth Of Well From Stick-Up (roc): **18.67'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **MON, 12 / 22 / 03**

(I) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

Time: **1:35 AM / PM**

(I) Water Level: 12 / 22 / 03 - 16.83'

Field Tech: **DGP**

(I) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None **X** Weak Moderate Strong Type Of Odor: **No Odor**

Other Notes: **N / A**

BAILING / EVACUATION DATA

Day / Date: **MON, 12 / 22 / 03**

Time: **2:05 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well ~ 0.17 gal / ft

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(18.67') - (16.83') = \mathbf{(1.84')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(1.84')} = \mathbf{0.32\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 07 / 03 (3) x (0.27-gal) = 0.81-gal
12 / 18 / 03 (3) x (0.32-gal) = 0.96-gal

Actual Volume (gal) Removed: hist-sampling not req mid year event 12 / 22 / 03: **1.5-gal**

Bailed To Dryness: Yes: No: **X** Notes: **N / A**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **2:10 AM / PM**

Time Bailing Ended: **2:30 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 2:15 pm *</u>	<u>0.5-gal</u>	<u>7.15</u>	<u>0.645</u>	<u>925 h</u>	<u>3.89</u>	<u>13.6</u>	<u>0.02</u>	<u>65</u>
<u>2- 2:20 pm *</u>	<u>0.5-gal</u>	<u>7.22</u>	<u>0.721</u>	<u>925 h</u>	<u>3.44</u>	<u>13.9</u>	<u>0.02</u>	<u>105</u>
<u>3- 2:25 am *</u>	<u>0.5-gal</u>	<u>7.10</u>	<u>0.798</u>	<u>455 m-h</u>	<u>3.51</u>	<u>14.2</u>	<u>0.02</u>	<u>95</u>
<u>12/22/ 03</u>	<u>1.5-gal</u>		<u>(ms/cm)</u>	<u>I-low m-medium h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

Discernable Odor During Event: None **X** Weak Moderate Strong Type Of Odor: **None**

Immiscible Layers: Yes No **X** LNAPL: **None** DNAPL: **None**

Turbidity, 3- Lit-Med Gry-"Milky", Low-Med Turbidity / Turbidity decreased slightly with depth-
bailing

Water Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 2:30 AM / PM

PZ-S19

OVERBURDEN WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA**BUILDING 20 / 25 MONITORING NETWORK****SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003****WELL I.D. # :****PZ-S19**Type Of Well: **Overburden Well**Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**Historical (07/07/03) Water Level From TOC: **16.12'**Total Depth Of Well From Stick-Up (roc): **19.38'**Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$ Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$ Well Condition: Good - No anomalies**WATER LEVEL DATA**Day / Date: MON, 12 / 22 / 03(I) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - NoneTime: 3:00 AM / PM(I) Water Level: 12 / 22 / 03 - 15.96'Field Tech: DGP(I) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: No OdorOther Notes: N / A**BAILING / EVACUATION DATA**Day / Date: MON, 12 / 22 / 03Time: 3:15 AM / PMField Tech: DGPGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$ Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(19.38') - (15.96') = \mathbf{(3.42')}$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(3.42')} = \mathbf{0.58\text{-gal}}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 07 / 03 (3) x (0.55-gal) = 1.65-gal
12 / 18 / 03 (3) x (0.58-gal) = 1.75-galActual Volume (gal) Removed: hist-sampling not req mid year event 12 / 22 / 03: 1.5-galBailed To Dryness: Yes: ☐ No: ☒ Notes: N / AEvacuation Method - Bailing: BailingPump: N / AIf Bailing: Time Bailing Began: 3:15 AM / PMTime Bailing Ended: 3:35 AM / PMIf Pumping: Time Pumping Began: N / ATime Pumping Ended: N / A**Stabilization Information - Measured For Each Well Volume Excavated**

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 3:15 pm *</u>	<u>0.5-gal</u>	<u>7.10</u>	<u>0.724</u>	<u>275 m</u>	<u>3.34</u>	<u>13.6</u>	<u>0.02</u>	<u>45</u>
<u>2- 3:25 pm *</u>	<u>0.5-gal</u>	<u>7.12</u>	<u>0.698</u>	<u>215 m</u>	<u>2.99</u>	<u>13.9</u>	<u>0.02</u>	<u>30</u>
<u>3- 3:35 am *</u>	<u>0.5-gal</u>	<u>7.15</u>	<u>0.845</u>	<u>175 l-m</u>	<u>3.77</u>	<u>14.2</u>	<u>0.02</u>	<u>40</u>
<u>12/22/ 03</u>	<u>1.5-gal</u>		<u>(ms/cm)</u>	<u>l-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: NoneImmiscible Layers: Yes ☐ No ☒LNAPL: NoneDNAPL: None

Gry, Low-Med Turbidity / Turbidity decreased slightly with depth-bailing

Water Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 3:40 AM / PM

APPENDIX A

OBSERVATION WELL FIELD DATA

**INCLUDES INFORMATION ABOUT WELLS THAT HAVE BEEN "LOST" / "DESTROYED"
OR ARE NO LONGER PART OF THE MONITORING PROGRAM**

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

SHALLOW BEDROCK WELLS:

- 1- MW-D1***
- 2- PZ-D2***
- 3- MW-D3***
- 4- MW-D4***
- 5- MW-D5***
- 6- MW-D6***
- 7- PZ-D7***
- 8- MW-D8***
- 9- MW-D9A***
- 10- MW-D15***
- 11- MW-D16***
- 12- PZ-D18***
- 13- PZ-D19***

MW-D1

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D1

Type Of Well: Shallow Bedrock Well

Stick-Up (TOC) From Ground Surface: 12/4/01: Top of PVC casing is at Ground Surface

Historical (07/07/03) Water Level From TOC: 9.93'

Total Depth Of Well From Stick-Up (TOC): 28.40'

Diameter Of Well: $d = 2\text{-in} = \underline{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \underline{0.085'}$

Well Condition: Good-No anomalies-"Sometimes difficult to access"-Rieger Crane Parking Area

WATER LEVEL DATA

Day / Date: FRI, 12 / 19 / 03

(1) LNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

Time: 11:25 AM / PM

(1) Water Level: 07 / 07 / 03 - 8.86'

Field Tech: DGP

(1) DNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

(1) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: No Odor

Other Notes: Very Slight sheen during well gauging and bailing

BAILING / EVACUATION DATA

Day / Date: FRI, 12 / 19 / 03

Time: 11:25 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \underline{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(28.40') - (8.86') = \underline{(19.54')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \underline{(19.54')} = \underline{3.32\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 08 / 03 (3) $\times (3.14\text{-gal}) = 9.42\text{-gal}$
12 / 19 / 03 (3) $\times (3.32\text{-gal}) = 9.96\text{-gal}$

Actual Volume (gal) Removed : hist- 07 / 08 / 03: 6.0-gal 12 / 19 / 03: 6.0-gal

Bailed To Dryness: Yes: ☐ No: ☒ Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 11:45 AM / PM

Time Bailing Ended: 11:55 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
1- 11:45 am *	2.0-gal	7.81	0.555	40 l	7.30	14.7	0.01	25
2- 11:50 am *	2.0-gal	7.75	0.675	10 l	7.40	15.1	0.01	80
3- 11:55 am *	2.0-gal	7.75	0.680	10 l	7.55	15.1	0.01	45
12 / 19 / 03	<u>6.0-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: None

UNSATURATED Layers: yes NO A LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Lit Gry to Clear, Low Turbidity, 2- Clear, V Low Turbidity

3- Clear, V Low Turbidity / Turbidity decreases with depth-bailing: *Very Slight Sheen* during bailing

Water Samples-For Chemical Analyses-Date / Time: FRI: 12 / 19 / 03 - 12:00 AM / PM

PZ-D2

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

PZ-D2

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: GS to TOPVC = 0.75'**

Historical (07/07/03) Water Level From TOC: **11.28'**

Total Depth Of Well From Stick-Up (TOC): **23.20'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good - No anomalies

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

Time: 12:20 AM / PM

(I) Water Level: 07 / 07 / 03 - 8.29'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐ Type Of Odor: No Odor

Other Notes: Very Slight Sheen during well gauging activity. No product odor, however.

BAILING / EVACUATION DATA

Day / Date: THU, 12 / 18 / 03

Time: 1:30 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(23.20') - (8.29') = \mathbf{(14.91')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(14.91')} = \mathbf{2.53\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 07 / 03 (3) x (2.02-gal) = 6.08-gal
12 / 18 / 03 (3) x (2.53-gal) = 7.60-gal

Actual Volume (gal) Removed: hist-sampling not req mid year event 12 / 18 / 03: 7.5-gal

Bailed To Dryness: Yes: ☐ No: ☒ Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 1:20 AM / PM

Time Bailing Ended: 1:40 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
1- 1:20 pm *	2.5-gal	7.22	1.91	750 h	3.57	15.2	0.06	55
2- 1:30 pm *	2.5-gal	7.35	2.05	650 h	3.78	14.8	0.06	50
3- 1:40 pm *	2.5-gal	7.25	1.85	450 m-h	3.92	15.1	0.06	75
12/ 18/ 03	<u>7.5-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☒ Moderate ☐ Strong ☐ Type Of Odor: Slight Product

Immiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Med-Drk Gry, High Turbidity, 2- Med-Drk, Brn-Gry, High Turbidity 3- Drk Gry, Med-High Turbidity / Turbidity decreases with depth-bailing / Very Slight Sheen and Weak Odor during bailing and sampling

Water Samples-For Chemical Analyses-Date / Time: THU: 12 / 18 / 03 - 1:45 AM / PM

MW-D3

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

This well has been permanently “**destroyed / lost**” and can no longer be utilized as a monitoring / sampling site.

[illegible]

MW-D4

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D4

Type Of Well: **Shallow Bedrock Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **11.05'**

Total Depth Of Well From Stick-Up (roc): **33.80'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Well is Located "Inside" Building # 20 - Good Condition / No Anomalies**

WATER LEVEL DATA

Day / Date: **MON, 12 / 15 / 03**

(I) LNAPL: 07 / 07 / 03 - **None** 12 / 15 / 03 - **None**

Time: **2:25 AM / PM**

(I) Water Level: 07 / 07 / 03 - **10.38'**

Field Tech: **DGP**

(I) DNAPL: 07 / 07 / 03 - **None** 12 / 15 / 03 - **None**

(I) Measured from Top Of Casing

Discernable Odor During Event: **None** ☒ **Weak** ☒ **Moderate** ☐ **Strong** Type Of Odor: **Product-Oil**

Other Notes: **Slight Product Odor and Very Slight Sheen during well gauging activity.**

BAILING / EVACUATION DATA

Day / Date: **WED, 12 / 17 / 03**

Time: **11:30 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(33.80') - (10.38') = \mathbf{(23.42')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(23.42')} = \mathbf{3.98\text{-gal}}$

Theoretical Volume(gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 (3) $\times (3.87\text{-gal}) = 11.60\text{-gal}$
12 / 17 / 03 (3) $\times (3.87\text{-gal}) = 11.94\text{-gal}$

Actual Volume (gal) Removed : hist- 07 / 08 / 03: **3.5-gal** 07 / 08 / 03: **4.5-gal**

Bailed To Dryness: Yes: ☐ No: ☒ **X**

Notes: **N / A**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **11:40 AM / PM**

Time Bailing Ended: **11:50 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
I- 11:50 am *	4.5-gal	7.10	0.955	10 l	0.75	15.5	0.04	85
12 / 17 / 03	<u>4.5-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: **None** ☒ **Weak** ☒ **Moderate** ☐ **Strong** Type Of Odor: **Slight Product**

Immiscible Layers: Yes ☐ No ☒ **X** LNAPL: **None** DNAPL: **None**

* Desc / Color / Comments **I- Lit Gry to Clear, Very Low Turbidity / Very Slight Sheen and Weak Odor during bailing and sampling**

Water Samples-For Chemical Analyses-Date / Time: **WED: 12 / 17 / 03 - 11:05 AM / PM**

MW-D5

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

Well # MW-D5 has been “**dropped**” from the monitoring and sampling program.

It is no longer utilized as a monitoring / sampling site.

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : **MW-D5** - WELL HAS BEEN " DROPPED " FROM PROGRAM

**THIS WELL IS NO LONGER USED AS A SAMPLING / MONITORING POINT -
WELL WAS "DROPPED" FROM THE MONITORING PLAN IN JUNE, 2000.**

**THEREFORE, WELL # MW-D5 IS NOT PART OF THE END OF YEAR
MONITORING / SAMPLING EVENT - DECEMBER, 2003.**

Type Of Well: **Shallow Bedrock Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (6/12/01) Water Level From TOC: N / A

Total Depth Of Well From Stick-Up (roc): N / A

Diameter Of Well: N / A

Radius Of Well: N / A

Well Condition: **Well is Located "Inside" Building # 25**

WATER LEVEL DATA

**WELL # MW-D5 IS NOT GAUGED AS PART OF THE END OF YEAR
MONITORING / SAMPLING EVENT - DECEMBER, 2003.**

Day / Date: N / A

(I) LNAPL: **hist: 6 / 12 / 00 - sheen**

Time: N / A

(I) Water Level: N / A

Field Tech: N / A

(I) DNAPL: N / A

(I) Measured from Top Of Casing

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Other Notes: N / A

BAILING / EVACUATION DATA

**WELL # MW-D5 IS NOT BAILED AS PART OF THE END OF YEAR
MONITORING / SAMPLING EVENT - DECEMBER, 2003.**

Day / Date: N / A Time: N / A Field Tech: N / A

Gallons Per Foot = (3.1416 x r² x 7.48): N / A

Thickness / Height (ft) Of Water Column = (**TD - WL**): N / A

Volume (gal) In Water Column = (GPF x TWC): N / A

Theoretical Volume (gal) To Be Removed = (VIWC x 3): N / A

Actual Volume (gal) Removed : N / A

Bailed To Dryness : Yes No Notes: N / A

Evacuation Method - Bailing: N / A **Pump:** N / A

If Bailing: Time Bailing Began: N / A Time Bailing Ended: N / A

If Pumping: Time Pumping Began: N / A Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCT- TIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A	N / A

Discernable Odor During Event: None Weak Moderate Strong Type Of Odor: N / A

Immiscible Layers: Yes No LNAPL N / A DNAPL N / A Desc / Color / Comments N / A

MW-D6

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D6

Type Of Well: **Shallow Bedrock Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **11.20'**

Total Depth Of Well From Stick-Up (roc): **31.80'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good - No anomalies

WATER LEVEL DATA

Day / Date: FRI, 12 / 19 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

Time: 12:55 AM / PM

(I) Water Level: 07 / 07 / 03 - 10.79'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 19 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: FRI, 12 / 19 / 03

Time: 1:25 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(31.80') - (10.79') = \mathbf{(21.01')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(21.01')} = \mathbf{3.57\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 08 / 03 (3) \times (3.50-gal) = 10.50-gal
12 / 19 / 03 (3) \times (3.57-gal) = 10.72-gal

Actual Volume (gal) Removed : hist- 07 / 09 / 03: 5.5-gal 12 / 19 / 03: 6.5-gal

Bailed To Dryness : Yes: ☐ No: ☒ Notes: Very Slight Sheen and Odor During Bailing

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 1:30 AM / PM

Time Bailing Ended: 1:45 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
1- 1:30 pm *	2.0-gal	7.10	0.755	10 /	4.85	14.8	0.03	- 85
2- 1:35 pm *	2.0-gal	7.15	0.725	80 /	5.55	15.1	0.03	- 55
3- 1:45 pm *	2.5-gal	7.14	0.715	80 /	5.95	15.2	0.03	- 10
12 / 19 / 03	<u>6.5-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☒ Moderate ☐ Strong Type Of Odor: Slight Product

Immiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Lit-Med Gry, Low Turbidity, 2- Lit Gry to Clear, Low Turbidity 3- Lit Gry to Clear, Low Turbidity / Turbidity decreases with depth-bailing / Very Slight Sheen and Weak Odor during bailing and sampling

Water Samples-For Chemical Analyses-Date / Time: WED: 07 / 09 / 03 - 9:15 AM / PM

PZ-D7

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

PZ-D7

Type Of Well: **Shallow Bedrock Well**

Stick-Up (toc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **10.78'**

Total Depth Of Well From Stick-Up (toc): **32.55'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good - No anomalies Located in grass area near IONICS office.

WATER LEVEL DATA

Day / Date: MON, 12 / 22 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

Time: 10:15 AM / PM

(I) Water Level: 12 / 22 / 03 - 10.71'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: MON, 12 / 22 / 03

Time: 10:15 AM / PM Field Tech: N / A

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = (TD - WL): $(32.55') - (10.71') = \mathbf{(21.84')}$

Volume (gal) In Water Column = (GPF x TWC): $(0.17 \text{ gal/ft}) \times \mathbf{(21.84')} = \mathbf{3.71\text{-gal}}$

Theoretical Volume (gal) To Be Removed = (VIWC x 3): hist: 07 / 07 / 03 (3) x (2.02-gal) = 6.08-gal
12 / 18 / 03 (3) x (2.53-gal) = 7.60-gal

Actual Volume (gal) Removed: hist-sampling not req mid year event 12 / 22 / 03: **7.0-gal**

Bailed To Dryness: Yes: ☐ No: ☒ Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 10:30 AM / PM

Time Bailing Ended: 10:40 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
15.2	3.5-gal	7.21	0.469	10 l	2.12	14.6	0.01	34
2- 10:40 pm *	3.5-gal	7.32	0.532	10 l	2.43	14.8	0.01	54
12 / 22 / 03	<u>7.0-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: None

Immiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Lit Gry to Clear, Very Low Turbidity, 2- Lit Gry to Clear, Very Low Turbidity

Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 10:45 AM / PM

MW-D8

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D8

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **16.71'**

Total Depth Of Well From Stick-Up (TOC): **28.70'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **MON, 12 / 15 / 03**

(I) LNAPL: 07 / 07 / 03 - **None** 12 / 15 / 03 - **None**

Time: **12:40 AM / PM**

(I) Water Level: 12 / 15 / 03 - **16.71'**

Field Tech: **DGP**

(I) DNAPL: 07 / 07 / 03 - **None** 12 / 15 / 03 - **None**

(I) Measured from Top Of Casing

Discernable Odor During Event: **None** ☒ **Weak** ☐ **Moderate** ☐ **Strong** ☐ Type Of Odor: **No Odor**

Other Notes: **N / A**

BAILING / EVACUATION DATA

Day / Date: **FRI, 12 / 19 / 03**

Time: **10:00 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(28.70') - (16.71') = \mathbf{(11.99')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17 \text{ gal/ft}) \times \mathbf{(11.99')} = \mathbf{2.38\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 08 / 03 (3) $\times (1.97\text{-gal}) = 5.90\text{-gal}$
12 / 19 / 03 (3) $\times (2.38\text{-gal}) = 6.11\text{-gal}$

Actual Volume (gal) Removed : hist- 07 / 08 / 03: **4.0-gal** 12 / 15 / 03: **5.5-gal**

Bailed To Dryness: Yes: ☐ No: ☒ Notes: **N / A**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **10:10 AM / PM**

Time Bailing Ended: **10:30 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
1- 10:10 am *	2.0-gal	7.06	0.645	795 h	1.83	15.1	0.02	45
2- 10:20 am *	1.5-gal	7.15	0.555	700 h	2.25	14.8	0.02	40
3- 10:30 am *	2.0-gal	7.10	0.625	555 m-h	3.45	15.0	0.02	40
12/19/03	<u>5.5-gal</u>		(ms/cm)	L-low m-medium h-high	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: **None** ☒ **Weak** ☒ **Moderate** ☐ **Strong** ☐ Type Of Odor: **Very weak odor and very slight sheen during sampling and bailing**

Immiscible Layers: Yes ☐ No ☒ LNAPL: **None** DNAPL: **None**

* Desc / Color / Comments 1- Drk Gry, High Turbidity, 2- Med-Drk Brn-Gry, High Turbidity

3- Med-Drk Gry, High Turbidity / **Very Slight Sheen during Sampling and Bailing**

Water Samples-For Chemical Analyses-Date / Time: **FRI: 12 / 19 / 03 - 10:40 AM / PM**

MW-D9A

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D9A

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/09/03) Water Level From TOC: **9.92'**

Total Depth Of Well From Stick-Up (TOC): **25.20'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: **Good - No anomalies**

WATER LEVEL DATA

Day / Date: **THU, 12 / 18 / 03**

(I) LNAPL: **07 / 09 / 03 - None 12 / 18 / 03 - None**

Time: **2:25 AM / PM**

(I) Water Level: **12 / 18 / 03 - 9.92'**

Field Tech: **DGP**

(I) DNAPL: **07 / 09 / 03 - None 12 / 18 / 03 - None**

(I) Measured from Top Of Casing

Discernable Odor During Event: **None X Weak Moderate Strong** Type Of Odor: **No Odor**

Other Notes: **N / A**

BAILING / EVACUATION DATA

Day / Date: **THU, 12 / 18 / 03**

Time: **3:00 AM / PM**

Field Tech: **DGP**

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well **~ 0.17 gal / ft**

Thickness / Height (ft) Of Water Column = $(TD - WL)$: **(25.20') - (9.92') = (15.28')**

Volume (gal) In Water Column = $(GPF \times TWC)$: **(0.17gal/ft) \times (15.28') = 2.59-gal**

Theoretical Volume(gal) To Be Removed = $(VIWC \times 3)$: hist: **07 / 09 / 03 (3) \times (2.69-gal) = 8.10-gal**
12 / 18 / 03 (3) \times (2.59-gal) = 8.10-gal

Actual Volume (gal) Removed : hist- **07 / 09 / 03: 6.5-gal** **12 / 18 / 03: 6.5-gal**

Bailed To Dryness: Yes: No: **X** Notes: **N / A**

Evacuation Method - Bailing: **Bailing**

Pump: **N / A**

If Bailing: Time Bailing Began: **3:00 AM / PM**

Time Bailing Ended: **3:20 AM / PM**

If Pumping: Time Pumping Began: **N / A**

Time Pumping Ended: **N / A**

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 3:05 pm *</u>	<u>2.5-gal</u>	<u>7.40</u>	<u>0.885</u>	<u>50 l</u>	<u>3.25</u>	<u>15.1</u>	<u>0.03</u>	<u>- 90</u>
<u>2- 3:15 pm *</u>	<u>2.0-gal</u>	<u>7.35</u>	<u>0.910</u>	<u>75 l</u>	<u>3.30</u>	<u>15.4</u>	<u>0.03</u>	<u>- 125</u>
<u>3- 3:20 pm *</u>	<u>2.0-gal</u>	<u>7.40</u>	<u>0.885</u>	<u>80 l</u>	<u>3.75</u>	<u>15.8</u>	<u>0.03</u>	<u>- 175</u>
<u>12 / 18 / 03</u>	<u>6.5-gal</u>		<u>(ms/cm)</u>	<u>l-low m-medium h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

Discernable Odor During Event: **None X Weak Moderate Strong** Type Of Odor: **None**

Immiscible Layers: Yes No **X** LNAPL: **None** DNAPL: **None**

* Desc / Color / Comments **1- Lit Gry, Low Turbidity, 2- Lit Gry to Clear, Low Turbidity,**
3- Clear, Low Turbidity

Water Samples-For Chemical Analyses-Date / Time: THU: 12 / 18 / 03 - 3:20 AM / PM

MW-D15

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D15

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **7.41'**

Total Depth Of Well From Stick-Up (TOC): **26.30'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good - No anomalies **Well is Located "Inside" Building # 25**

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

Time: 1:20 AM / PM

(I) Water Level: 12 / 15 / 03 - 7.66'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak Moderate Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: WED, 12 / 17 / 03

Time: 9:00 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(26.30') - (7.66') = \mathbf{(18.64')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(18.64')} = \mathbf{3.17\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 (3) x (3.21-gal) = 9.63-gal
12 / 17 / 03 (3) x (3.17-gal) = 9.51-gal

Actual Volume (gal) Removed : hist- 07 / 08 / 03: 1.0-gal 12 / 17 / 03: 6.0-gal

Bailed To Dryness: Yes: No: ☒ Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 9:15 AM / PM

Time Bailing Ended: 9:25 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
1- 9:15 am *	3.0-gal	8.50	0.849	10 l	8.44	16.7	0.04	198
2- 9:25 am *	3.0-gal	8.14	0.718	10 l	8.84	15.7	0.04	142
07/09/03	<u>6.0-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☒ Moderate Strong Type Of Odor: Very weak odor and very slight sheen during sampling and bailing

Immiscible Layers: Yes No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Lit Gry to Clear, Low Turbidity 2- Lit Gry, Low Turbidity / Very Slight Sheen during Sampling and Bailing

Water Samples-For Chemical Analyses-Date / Time: WED: 12 / 17 / 03 - 9:30 AM / PM

MW-D16

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-D16

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **11.91'**

Total Depth Of Well From Stick-Up (TOC): **29.90'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5) = \mathbf{0.085'}$

Well Condition: Good - No anomalies **Well is Located "Inside" Building # 20**

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

Time: 1:25 AM / PM

(I) Water Level: 12 / 15 / 03 - 11.57'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None **X** Weak Moderate Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: WED, 12 / 17 / 03

Time: 9:35 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(29.90') - (11.57') = \mathbf{(18.33')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(18.33')} = \mathbf{3.12\text{-gal}}$

Theoretical Volume(gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 $(3) \times (3.06\text{-gal}) = 9.17\text{-gal}$
12 / 17 / 03 $(3) \times (3.06\text{-gal}) = 9.35\text{-gal}$

Actual Volume (gal) Removed : hist- 07 / 08 / 03: 2.5-gal 12 / 17 / 03: 5.5-gal

Bailed To Dryness: Yes: _____ No: **X** Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 9:35 AM / PM

Time Bailing Ended: 9:45 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 9:35 am *</u>	<u>2.5-gal</u>	<u>6.83</u>	<u>0.531</u>	<u>10 l</u>	<u>0.293</u>	<u>15.8</u>	<u>0.02</u>	<u>- 5</u>
<u>2- 9:45 am *</u>	<u>3.0-gal</u>	<u>6.98</u>	<u>0.334</u>	<u>10 l</u>	<u>0.498</u>	<u>15.6</u>	<u>0.02</u>	<u>22</u>
<u>12 / 17 / 03</u>	<u>5.5-gal</u>		<u>(ms/cm)</u>	<u>I-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

Discernable Odor During Event: None **X** Weak **X** Moderate Strong Type Of Odor: Very weak odor and very slight sheen during sampling and bailing

Immiscible Layers: Yes___ No **X** LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Lit Gry to Clear, Low Turbidity, 2- Lit Gry to Clear, Low Turbidity / Very Slight Sheen during Sampling and Bailing

Water Samples-For Chemical Analyses-Date / Time: WED: 12 / 17 / 03 - 9:50 AM / PM

PZ-D18

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

PZ-D18

Type Of Well: **Shallow Bedrock Well**

Stick-Up (TOC) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **21.04'**

Total Depth Of Well From Stick-Up (TOC): **40.10'**

Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$

Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$

Well Condition: Good - No anomalies

WATER LEVEL DATA

Day / Date: MON, 12 / 22 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

Time: 1:30 AM / PM

(I) Water Level: 12 / 22 / 03 - 20.97'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: MON, 12 / 22 / 03

Time: 1:30 AM / PM

Field Tech: N / A

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(40.10') - (20.97') = \mathbf{(19.13')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.17\text{gal/ft}) \times \mathbf{(19.13')} = \mathbf{3.25\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 07 / 03 (3) x (3.24-gal) = 9.72-gal
12 / 22 / 03 (3) x (3.25-gal) = 9.76gal

Actual Volume (gal) Removed: hist-sampling not req mid year event 12 / 22 / 03: **9.0-gal**

Bailed To Dryness: Yes: ☐ No: ☒ Notes: N / A

Evacuation Method - Bailing: Bailing

Pump: N / A

If Bailing: Time Bailing Began: 1:40 AM / PM

Time Bailing Ended: 1:55 AM / PM

If Pumping: Time Pumping Began: N / A

Time Pumping Ended: N / A

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
1- 1:40 pm *	3.0-gal	7.81	0.435	355 m	3.25	13.8	0.02	25
2- 1:45 pm *	3.0-gal	7.75	0.425	150 l-m	2.95	13.8	0.02	10
3- 1:55 pm *	3.0-gal	7.75	0.495	55 l	2.55	14.1	0.02	45
12 / 22 / 03	<u>9.0-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: None

Immiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Med Gry, Med Turbidity 2- Lit-Med Gry, Low-Med Turbidity 3- Lit Gry-Clear,
Low Turbidity / Turbidity decreases with depth-bailing

Water Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 2:00 AM / PM

PZ-D19

SHALLOW BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA**BUILDING 20 / 25 MONITORING NETWORK****SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003****WELL I.D. # :****PZ-D19**Type Of Well: **Shallow Bedrock Well**Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**Historical (07/07/03) Water Level From TOC: **22.31'**Total Depth Of Well From Stick-Up (roc): **30.68'**Diameter Of Well: $d = 2\text{-in} = \mathbf{0.17'}$ Radius Of Well: $r = (0.17') \times (0.5') = \mathbf{0.085'}$ Well Condition: Good - No anomalies**WATER LEVEL DATA**Day / Date: MON, 12 / 22 / 03(1) LNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - NoneTime: 3:05 AM / PM(1) Water Level: 12 / 22 / 03 - 21.92'Field Tech: DGP(1) DNAPL: 07 / 07 / 03 - None 12 / 22 / 03 - None

(1) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: No OdorOther Notes: N / A**BAILING / EVACUATION DATA**Day / Date: MON, 12 / 22 / 03Time: 3:05 AM / PMField Tech: N / AGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 2-in dia well $\sim \mathbf{0.17 \text{ gal / ft}}$ Thickness / Height (ft) Of Water Column = $(\text{TD} - \text{WL})$: $(30.68') - (21.92') = \mathbf{(8.76')}$ Volume (gal) In Water Column = $(\text{GPF} \times \text{TCW})$: $(0.17 \text{ gal/ft}) \times \mathbf{(8.76')} = \mathbf{1.49\text{-gal}}$ Theoretical Volume (gal) To Be Removed = $(\text{VIWC} \times 3)$: hist: 07 / 07 / 03 (3) x (1.42-gal) = 4.26-gal
12 / 22 / 03 (3) x (1.49-gal) = 4.47galActual Volume (gal) Removed: hist-sampling not req mid year event 12 / 22 / 03: **6.50-gal**Bailed To Dryness: Yes: ☐ No: ☒ Notes: N / AEvacuation Method - Bailing: BailingPump: N / AIf Bailing: Time Bailing Began: 3:35 AM / PMTime Bailing Ended: 3:50 AM / PMIf Pumping: Time Pumping Began: N / ATime Pumping Ended: N / A**Stabilization Information - Measured For Each Well Volume Excavated**

TIME	VOL REMOVED	pH	CONDUCTIVITY	TURBIDITY	DO	TEMP	SALINITY	ORP
1- 3:35 pm *	2.0-gal	7.75	0.220	885 h	3.05	14.1	0.02	35
2- 3:45 pm *	2.5-gal	7.70	0.355	455 m-h	2.40	14.4	0.02	65
3- 3:50 pm *	2.0-gal	7.65	0.455	350 m	2.25	14.2	0.02	15
12 / 22 / 03	<u>6.5-gal</u>		(ms/cm)	<i>l-low</i> <i>m-medium</i> <i>h-high</i>	(mg/l)	(°C)	(%)	(m/v)

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong Type Of Odor: NoneImmiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None* Desc / Color / Comments 1- Lit-Med Gry-"Milky", High Turbidity 2- Med Gry-"Milky", Med-High Turbidity
3- Med Brn-Gry, Med-High TurbidityWater Samples-For Chemical Analyses-Date / Time: MON: 12 / 22 / 03 - 4:00 AM / PM

APPENDIX A

OBSERVATION WELL FIELD DATA

**INCLUDES INFORMATION ABOUT WELLS THAT HAVE BEEN "LOST" / "DESTROYED"
OR ARE NO LONGER PART OF THE MONITORING PROGRAM**

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

DEEP BEDROCK WELLS:

1- MW-9

2- MW-11

3- MW-12

4- PZ-D14

MW-9

DEEP BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : MW-9

Type Of Well: **Deep Bedrock Well**

Stick-Up (roc) From Ground Surface: **12/4/01: Top of PVC casing is at Ground Surface**

Historical (07/07/03) Water Level From TOC: **8.61'**

Total Depth Of Well From Stick-Up (roc): **85.00'**

Diameter Of Well: $d = 4\text{-in} = \mathbf{0.33'}$

Radius Of Well: $r = (0.33') \times (0.5') = \mathbf{0.165'}$

Well Condition: Good - No anomalies

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(n) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

Time: 3:30 AM / PM

(n) Water Level: 12 / 15 / 03 - 8.82'

Field Tech: DGP

(n) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐

Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: THU, 12 / 18 / 03

Time: 3:20 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 4-in dia well $\sim \mathbf{0.64 \text{ gal / ft}}$

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(85.00') - (8.82') = \mathbf{(76.18')}$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.64\text{gal/ft}) \times \mathbf{(76.18')} = \mathbf{48.75\text{-gal}}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 $(3) \times (48.89\text{-gal}) = 146.67\text{-gal}$
12 / 18 / 03 $(3) \times (48.75\text{-gal}) = \mathbf{146.27\text{-gal}}$

Actual Volume (gal) Removed: hist - 07 / 08 / 03: 140.0-gal 12 / 18 / 03: 145.0-gal

Bailed To Dryness: Yes: ☐ No: ☒ Notes: Did not "pump well dry" - Pump "hung at" 75' depth in hole and "pulled-up" to a depth of about 40' during pumping / draw down.

Evacuation Method - Bailing: N / A

Pump: Portable, In-Line Super Purger Pumps

If Bailing: Time Bailing Began: N / A

Time Bailing Ended: N / A

If Pumping: Time Pumping Began: 3:25 AM / PM

Time Pumping Ended: 4:00 AM / PM

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 3:40 pm*</u>	<u>5.0-gal</u>	<u>9.78</u>	<u>0.97</u>	<u>10 l</u>	<u>2.67</u>	<u>14.2</u>	<u>0.03</u>	<u>215</u>
<u>2- 3:50 pm *</u>	<u>5.0-gal</u>	<u>9.65</u>	<u>1.21</u>	<u>10 l</u>	<u>2.45</u>	<u>14.3</u>	<u>0.03</u>	<u>195</u>
<u>3- 4:00 pm *</u>	<u>5.0-gal</u>	<u>9.65</u>	<u>0.85</u>	<u>10 l</u>	<u>2.40</u>	<u>14.5</u>	<u>0.03</u>	<u>105</u>
<u>12 / 18 / 03</u>	<u>15.0-gal</u>		<u>(ms/cm)</u>	<u>l-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

* Pumped well between 3:25 PM and 4:00 PM (about 35 minutes). Collected an approximate 15-gallon sample (approx 5-gal "every 10-minutes") in order to perform stabilization tests-prior to sample collection for chemical analyses..

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong ☐

Type Of Odor: None

Immiscible Layers: Yes ☐ No ☒

LNAPL: None

DNAPL: None

* Desc / Color / Comments 1- Clear, No Odor, No Sheen, Very Low Turbidity, 2- Clear, No Odor, No Sheen, Very Low Turbidity 3- Clear, No Odor, No Sheen, Very Low Turbidity

Water Samples-For Chemical Analyses-Date / Time: THU: 12 / 18 / 03 - 4:00 PM

MW-11

DEEP BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

NOTE:

Two sets of water samples are collected from Well # MW-11
for quality control purposes:

Sample #'s MW-11a and MW-11b

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : MW-11 * duplicate water samples for quality control *Type Of Well: Deep Bedrock WellStick-Up (toc) From Ground Surface: Top of PVC casing is at Ground SurfaceHistorical (07/07/03) Water Level From TOC: 8.48'Total Depth Of Well From Stick-Up (toc): 75.50'Diameter Of Well: $d = 4\text{-in} = 0.33'$ Radius Of Well: $r = (0.33') \times (0.5') = 0.165'$ Well Condition: Well is Located "Inside" Building # 20-Good Condition / No AnomaliesWATER LEVEL DATADay / Date: MON, 12 / 15 / 03(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - NoneTime: 2:10 AM / PM(I) Water Level: 12 / 15 / 03 - 8.78'Field Tech: DGP(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None X Weak Moderate Strong Type Of Odor: No OdorOther Notes: Collected two / duplicate "sets" of groundwater samples for quality control purposes: MW-11a and MW-11bBAILING / EVACUATION DATADay / Date: WED, 12 / 17 / 03Time: 12:00 AM / PMField Tech: DGPGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 4-in dia well ~ 0.64 gal / ftThickness / Height (ft) Of Water Column = $(TD - WL)$: $(75.50') - (8.78') = (67.72')$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.64\text{gal/ft}) \times (67.72') = 42.70\text{-gal}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 09 / 03 $(3) \times (42.89\text{-gal}) = 128.67\text{-gal}$
12 / 17 / 03 $(3) \times (42.70\text{-gal}) = 128.10\text{-gal}$ Actual Volume (gal) Removed: hist - 07 / 08 / 03: 130.0-gal 12 / 17 / 03: 145.0-galBailed To Dryness: Yes: No X Notes: Did not "pump well dry" - Pump "hung at" 55' depth in hole and "pulled-up" to a depth of about 25' during pumping / draw down.Evacuation Method - Bailing: N / APump: Portable, In-Line Super Purger PumpsIf Bailing: Time Bailing Began: N / ATime Bailing Ended: N / AIf Pumping: Time Pumping Began: 12:00 AM / PMTime Pumping Ended: 12:35 AM / PMStabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 12:35 pm *</u>	<u>5.0-gal</u>	<u>9.03</u>	<u>1.24</u>	<u>10 l</u>	<u>2.59</u>	<u>15.1</u>	<u>0.04</u>	<u>206</u>
<u>2- 12:40 pm *</u>	<u>5.0-gal</u>	<u>8.98</u>	<u>1.15</u>	<u>30 l</u>	<u>2.55</u>	<u>15.1</u>	<u>0.05</u>	<u>180</u>
<u>3- 12:45 pm *</u>	<u>5.0-gal</u>	<u>8.75</u>	<u>1.20</u>	<u>10 l</u>	<u>2.31</u>	<u>15.3</u>	<u>0.05</u>	<u>145</u>
<u>12 / 17 / 03</u>	<u>15.0-gal</u>		<u>(ms/cm)</u>	<u>l-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

* Pumped well between 12:00 PM and 12:35 PM (about 35 minutes). Then, collected an approximate 15-gal sample (approx 5-gal "every 5-minutes") in order to perform stabilization tests. Collected analytical samples between 12:20 and 12:30 PM.

Discernable Odor During Event: None X Weak Moderate Strong Type Of Odor: NoneImmiscible Layers: Yes No X LNAPL: None DNAPL: None* Desc / Color / Comments 1- Clear, No Odor, No Sheen, Very Low Turbidity, 2- Clear, No Odor, No Sheen, Very Low Turbidity 3- Clear, No Odor, No Sheen, Very Low TurbidityWater Samples-For Chemical Analyses-Date / Time: WED: 12 / 17 / 03 - # 11a 12:20 PM # 11b 12:30 PM

MW-12

DEEP BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # :

MW-12Type Of Well: Deep Bedrock WellStick-Up (roc) From Ground Surface: 12/4/01: GS to TOCSC - 2.4' / TPVC to TOCSC - 0.50'Historical (07/07/03) Water Level From TOC: 13.66'Total Depth Of Well From Stick-Up (roc): 91.00'Diameter Of Well: $d = 4\text{-in} = 0.33'$ Radius Of Well: $r = (0.33') \times (0.5') = 0.165'$ Well Condition: Good - No anomaliesWATER LEVEL DATADay / Date: MON, 12/15/03(I) LNAPL: 07/07/03 - None 12/15/03 - NoneTime: 1:10 AM/PM(I) Water Level: 07/07/03 - 14.06'Field Tech: DGP(I) DNAPL: 07/07/03 - None 12/15/03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None X Weak Moderate StrongType Of Odor: No OdorOther Notes: N/ABAILING / EVACUATION DATADay / Date: FRI, 12/19/03Time: 11:00 AM/PMField Tech: DGPGallons Per Foot = $(3.1416 \times r^2 \times 7.48)$; for a 4-in dia well ~ 0.64 gal / ftThickness / Height (ft) Of Water Column = $(TD - WL)$: $(91.00') - (14.06') = (76.94')$ Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.64\text{gal/ft}) \times (76.94') = 49.24\text{-gal}$ Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07/09/03 $(3) \times (49.50\text{-gal}) = 148.50\text{-gal}$
12/19/03 $(3) \times (49.24\text{-gal}) = 147.73\text{-gal}$ Actual Volume (gal) Removed: hist - 07/08/03: 150.0-gal 12/19/03: 150.0-galBailed To Dryness: Yes: No X Notes: Did not "pump well dry" - Pump "hung at" 75' depth in hole and "pulled-up" to a depth of about 40' during pumping / draw down.Evacuation Method - Bailing: N/APump: Portable, In-Line Super Purger PumpsIf Bailing: Time Bailing Began: N/ATime Bailing Ended: N/AIf Pumping: Time Pumping Began: 11:00 AM/PMTime Pumping Ended: 11:30 AM/PMStabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
<u>1- 11:10 am*</u>	<u>5.0-gal</u>	<u>8.75</u>	<u>1.50</u>	<u>10 l</u>	<u>2.59</u>	<u>15.1</u>	<u>0.04</u>	<u>206</u>
<u>2- 11:20 am*</u>	<u>5.0-gal</u>	<u>8.76</u>	<u>1.51</u>	<u>10 l</u>	<u>2.55</u>	<u>15.1</u>	<u>0.05</u>	<u>180</u>
<u>3- 11:30 am*</u>	<u>5.0-gal</u>	<u>8.73</u>	<u>1.50</u>	<u>10 l</u>	<u>2.31</u>	<u>15.3</u>	<u>0.05</u>	<u>145</u>
<u>12/19/03</u>	<u>15.0-gal</u>		<u>(ms/cm)</u>	<u>l-low</u> <u>m-medium</u> <u>h-high</u>	<u>(mg/l)</u>	<u>(°C)</u>	<u>(%)</u>	<u>(m/v)</u>

* Pumped well between 11:00 AM and 11:30 AM (about 30 minutes). Then, collected an approximate 15-gallon sample (approx 5-gal "every 10-minutes") in order to perform stabilization tests-prior to sample collection for chemical analyses..

Discernable Odor During Event: None X Weak Moderate StrongType Of Odor: NoneImmiscible Layers: Yes No XLNAPL: NoneDNAPL: None* Desc / Color / Comments 1- Clear, No Odor, No Sheen, Very Low Turbidity, 2- Clear, No Odor, No Sheen, Very Low Turbidity 3- Clear, No Odor, No Sheen, Very Low TurbidityWater Samples-For Chemical Analyses-Date / Time: FRI: 12/19/03 - 11:30 AM

PZ-D14

DEEP BEDROCK WELL

OBSERVATION WELL FIELD DATA

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END-OF-YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

OBSERVATION WELL FIELD DATA

BUILDING 20 / 25 MONITORING NETWORK

SEMI ANNUAL, END OF YEAR MONITORING / SAMPLING EVENT - DEC, 2003

WELL I.D. # : PZ-D14

Type Of Well: **Deep Bedrock Well**

Stick-Up (roc) From Ground Surface: 12/4/01: GS to TPVC - (- 0.42')

Historical (07/07/03) Water Level From TOC: 16.11'

Total Depth Of Well From Stick-Up (roc): 89.00'

Diameter Of Well: $d = 4\text{-in} = 0.33'$

Radius Of Well: $r = (0.33') \times (0.5') = 0.165'$

Well Condition: Good - No anomalies

WATER LEVEL DATA

Day / Date: MON, 12 / 15 / 03

(I) LNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

Time: 12:25 AM / PM

(I) Water Level: 12 / 15 / 03 - 16.42'

Field Tech: DGP

(I) DNAPL: 07 / 07 / 03 - None 12 / 15 / 03 - None

(I) Measured from Top Of Casing

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong

Type Of Odor: No Odor

Other Notes: N / A

BAILING / EVACUATION DATA

Day / Date: THU, 12 / 18 / 03

Time: 1:15 AM / PM

Field Tech: DGP

Gallons Per Foot = $(3.1416 \times r^2 \times 7.48)$: for a 4-in dia well ~ **0.64 gal / ft**

Thickness / Height (ft) Of Water Column = $(TD - WL)$: $(89.00') - (16.42') = (46.45')$

Volume (gal) In Water Column = $(GPF \times TWC)$: $(0.64\text{gal/ft}) \times (72.58') = 48.75\text{-gal}$

Theoretical Volume (gal) To Be Removed = $(VIWC \times 3)$: hist: 07 / 03 Not Bailed/Pumped-Smpl Not Req
12 / 18 / 03 $(3) \times (48.75\text{-gal}) = 139.35\text{-gal}$

Actual Volume (gal) Removed: hist - 07 / 03: Sample Not Required 12 / 18 / 03: 130.0-

gal
Bailed To Dryness: Yes: ☐ No: ☒ Notes: Did not "pump well dry" - Pump "hung at" 55' depth in hole and "pulled-up" to a depth of about 20' during pumping / draw down.

Evacuation Method - Bailing: N / A

Pump: Portable, In-Line Super

~~If Bailing:~~ Time Bailing Began: N / A

Time Bailing Ended: N / A

If Pumping: Time Pumping Began: 3:25 AM / PM

Time Pumping Ended: 4:00 AM / PM

Stabilization Information - Measured For Each Well Volume Excavated

<u>TIME</u>	<u>VOL REMOVED</u>	<u>pH</u>	<u>CONDUCTIVITY</u>	<u>TURBIDITY</u>	<u>DO</u>	<u>TEMP</u>	<u>SALINITY</u>	<u>ORP</u>
1- 12:50 pm*	5.0-gal	7.95	1.31	10 l	4.51	12.1	0.05	55
2- 1:00 pm *	5.0-gal	7.80	1.25	10 l	3.55	14.1	0.05	70
3- 1:10 pm *	5.0-gal	7.75	1.30	25 l	4.55	14.8	0.05	60
12 / 18 / 03	<u>15.0-gal</u>		(ms/cm)	l-low m-medium h-high	(mg/l)	(°C)	(%)	(m/v)

* Pumped well between 12:40 PM and 1 : 15 PM (about 35 minutes). Collected an approximate 15-gal sample (approx 5-gal "every 10-minutes") in order to perform stabilization tests prior to sample collection for chemical analyses.

Discernable Odor During Event: None ☒ Weak ☐ Moderate ☐ Strong

Type Of Odor: None

Immiscible Layers: Yes ☐ No ☒ LNAPL: None DNAPL: None

* Desc / Color / Comments 1- Clear, No Odor, No Sheen, Very Low Turbidity, 2- Clear, No Odor, No Sheen, Very Low Turbidity 3- Clear, No Odor, No Sheen, Very Low Turbidity

Water Samples-For Chemical Analyses-Date / Time: THU: 12 / 18 / 03 - 1:15 PM

APPENDIX B

RESULTS OF CHEMICAL ANALYSES

**TWENTY THREE MONITORING WELLS, INCLUDING RESULTS FOR THE
EQUIPMENT BLANK, FIELD BLANK, AND TRIP BLANK**

PA. TRANSFORMER TECHNOLOGY, INC.

BUILDING 20 / 25 MONITORING NETWORK

END OF YEAR MONITORING / SAMPLING EVENT - DECEMBER, 2003

**SAMPLES WERE COLLECTED FROM THE FOLLOWING
TWENTY THREE WELLS FOR CHEMICAL ANALYSES AS PART OF
THE END OF YEAR, 2003 MONITORING / SAMPLING EVENT:**

OVERBURDEN WELLS:

- 1- MW-S1*
- 2- MW-S4*
- 3- MW-S6*
- 4- MW-S8*
- 5- MW-S9A*
- 6- MW-S10*
- 7- PZ-S18*
- 8- PZ-S19*

SHALLOW BEDROCK WELLS:

- 9- MW-D1*
- 10- PZ-D2*
- 11- MW-D4*
- 12- MW-D6*
- 13- PZ-D7*
- 14- MW-D8*
- 15- MW-D9A*
- 16- MW-D15*
- 17- MW-D16*
- 18- PZ-D18*
- 19- PZ-D19*

DEEP BEDROCK WELLS:

- 20- MW-9*
- 21- MW-11*
- 22- MW-12*
- 23- PZ-D14*

BLANKS:

- 1- Equipment Blank*
- 2- Field Blank*
- 3- Trip Blank*

CHAIN-OF-CUSTODY FOR BUILDING 20 / 25 SAMPLES